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GUIDE

TO THE

FIELD COLUMBIAN MUSEUM



WITH DIAGRAMS AND DESCRIPTIONS



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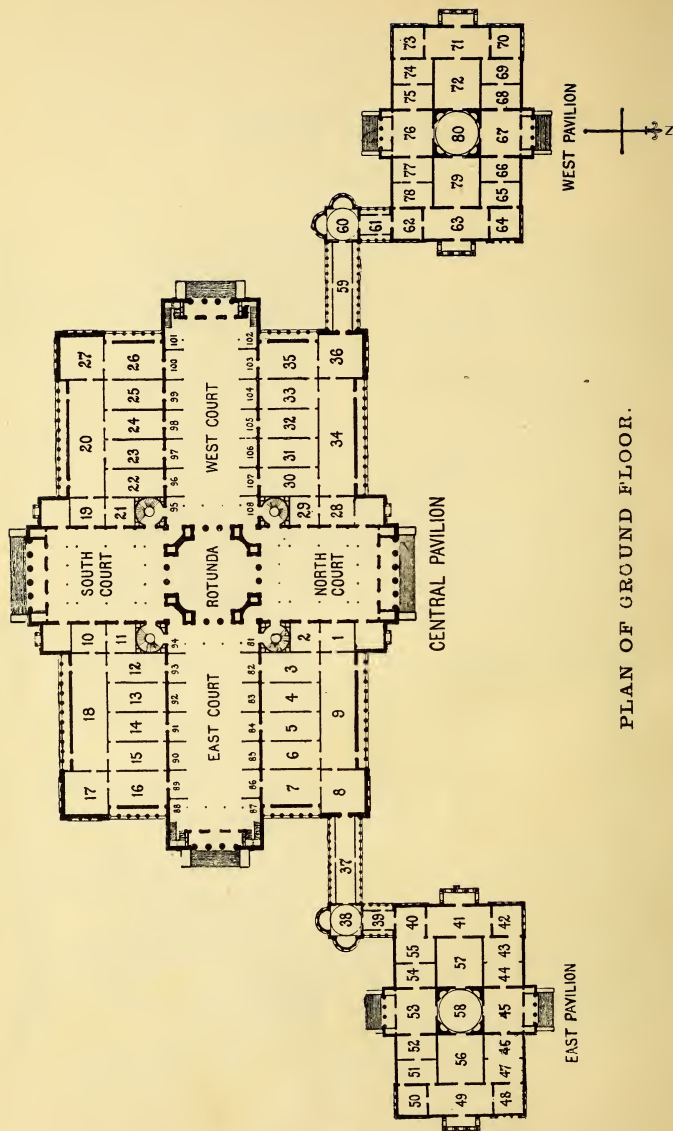


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PLAN OF GROUND FLOOR.

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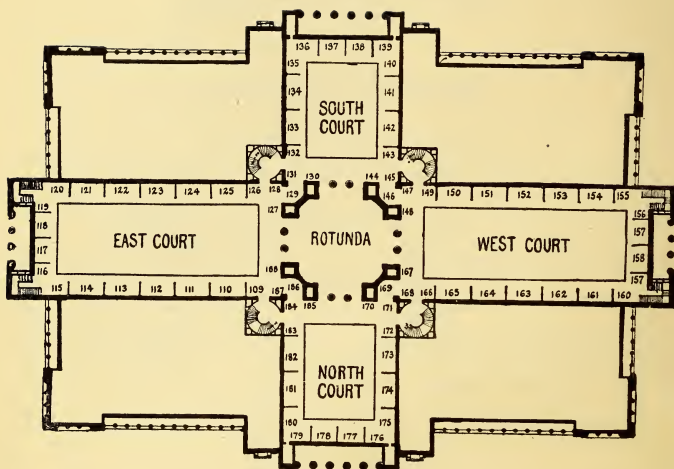
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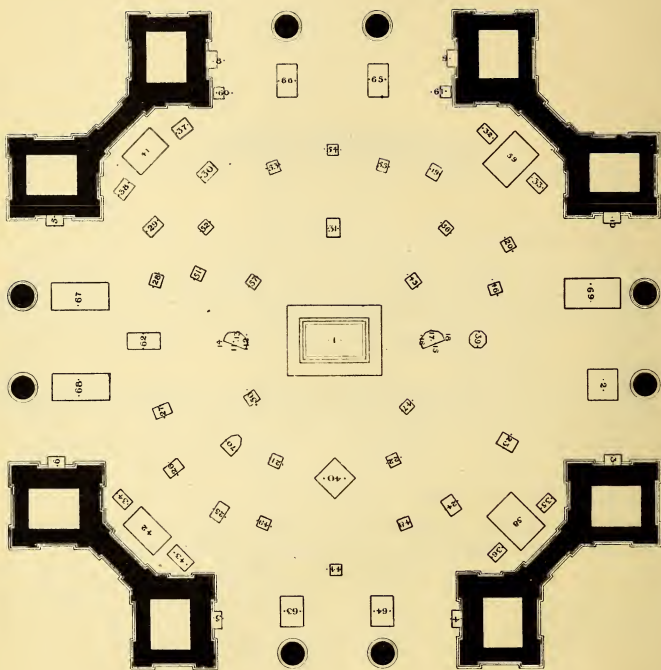


PLAN OF UPPER GALLERY.

INTRODUCTION.

The Guide locates, by means of carefully prepared plans and a system of numbers, the collections and principal objects of interest in the Halls, Courts, Alcoves, and Galleries. The diagrams are accompanied by descriptions in sufficient detail to add interest to the specimens and collections, but not attempting exhaustive treatment.

Because of their historical significance the Columbian Rotunda and the Columbus Memorial Museum are described first. They are followed by the Courts and by the Departments, which are taken up separately in the order of their usual sequence, beginning with Natural History—Geology, Botany and Zoology—and concluding with the Departments relating to Man and His Works—Anthropology, Industrial Arts, and the Museum of the World's Railway. An account of the Library and Lecture Hall is added. In the appendix will be found an alphabetical list of all donors, loan contributors, and collectors.



PLAN OF ROTUNDA.



THE COLUMBIAN ROTUNDA.

The Rotunda of the main building of the Museum is devoted to an artistic memorial of Columbus and of the Columbian Exposition. The center-piece—the statue of the Great Discoverer with uplifted sword consecrating the New World—at once attracts attention both as an historical study and as a masterpiece of art. The original models of the figures and groups of figures ornamenting the main Exposition buildings, and donated by the Exposition to the Museum, occupy the entire space around the statue. These models are invaluable as works of modern art, representing the genius of the most talented sculptors of the present day.

In the contracts entered into with the various prominent sculptors they were called upon to furnish what are called "Sketches" of the sculptural decorations, i. e., the models were to be about one-sixth of the full size; from these models the Exposition's force of sculptors prepared full-size work by enlarging the "Sketches" six times. All the models were first submitted to the architects of the buildings for their approval, in order to harmonize the sculptural decorations with the architecture. The models here shown are the original "Sketches."

No. 1.—Columbus. By Augustus St. Gaudens. This imposing full size statue stood overlooking the Court of Honor at the main portal of the Administration Building. Translation of Latin inscription on pedestal:

"In late years the centuries will come
 "When the ocean will loose its fetters
 "And the vast earth will lie open,
 "And Tethys will disclose new countries,
 "When Thule will no longer be the remotest of lands."

No. 2.—Statue of the Republic. By Daniel C. French.

Nos. 3 to 38.—Statuary on Administration Building. By Karl Bitter, Sculptor.

- | | |
|------------------------|-----------------------|
| 3. Water Controlled. | 10. Air Uncontrolled. |
| 4. Water Uncontrolled. | 11. Goddess of Fire. |
| 5. Fire Controlled. | 12. Fisher Maiden. |
| 6. Fire Uncontrolled. | 13. Bather. |
| 7. Earth Controlled. | 14. Diana. |
| 8. Earth Uncontrolled. | 15. Air. |
| 9. Air Controlled. | 15. Harvest Girl. |

- | | |
|------------------|----------------|
| 17. Blacksmith. | 28. Diligence. |
| 18. Flower Girl. | 29. Joy. |
| 19. Patriotism. | 30. Unity. |
| 20. Tradition. | 31. Strength. |
| 21. Education. | 32. Peace. |
| 22. Truth. | 33. Religion. |
| 23. Strength. | 34. Industry. |
| 24. Liberty. | 35. Art. |
| 25. Charity. | 36. Commerce. |
| 26. Abundance. | 37. War. |
| 27. Theology. | 38. Justice. |

Nos. 39 to 45.—Sculpture Work on Agricultural Building.
By Philip Martiny.

- | | |
|-------------------|------------------|
| 39. Four Nations. | 42. Horse Group. |
| 40. Four Seasons. | 43. Ceres. |
| 41. Cattle Group. | 44. Zodaic. |
| | 45. Victory. |

Nos. 46 to 51.—Figures of Inventors. Sculpture Work
on Machinery Hall. By Robert Kraus.

- | | |
|---------------|-----------------|
| 46. Galvane. | 49. Ericsson. |
| 47. Whitney. | 50. James Watt. |
| 48. Daguerre. | 51. Senfelder. |

Nos. 52 to 56.—Five Figures on Machinery Hall. By M.
A. Waagen.

- | | | |
|--------------|------------|--------------|
| 52. Science. | 54. Water. | 56. Air. |
| 53. Earth. | 55. Fire. | 57. Victory. |

Nos. 58 and 59.—Sculpture on Colonnade, by M. A. Waagen.

- | | |
|------------------|-------------------|
| 58. Horse Group. | 59. Cattle Group. |
|------------------|-------------------|

Nos. 60 and 61.—Electricity Building.

- | |
|---|
| 60. Electrification, by I. A. Blankinship. |
| 61. Experimental Electricity, by N. A. McNeill. |

No. 62.—Sculpture Work on Lagoons.

- | |
|---|
| 62. Lion at Base of Obelisk, by M. A. Waagen. |
|---|

Nos. 63 to 66.—Sculpture Work on Boat Landings. By
D. C. French and E. C. Potter.

- | | |
|-----------------------|-------------------------|
| 63. Industry (Horse). | 65. Wheat (Bull). |
| 64. Sloth (Horse). | 66. Indian Corn (Bull). |

Nos. 67 to 69.—Sculpture Work on Bridges of Lagoons.
By Edward Kemeys.

- | | |
|---------------------|---------------------|
| 67. Buffalo—Male. | 68. Buffalo—Female. |
| 69. The Still Hunt. | |

No. 70.—Glorification of Discovery. By Cratt.

COLUMBUS MEMORIAL MUSEUM.

The Columbus Memorial Museum consists of relics collected for the World's Columbian Exposition under the supervision of Mr. Wm. Elroy Curtis, of Washington, and sheltered for exhibition during the Exposition in the reproduction of the Monastery of La Rabida.

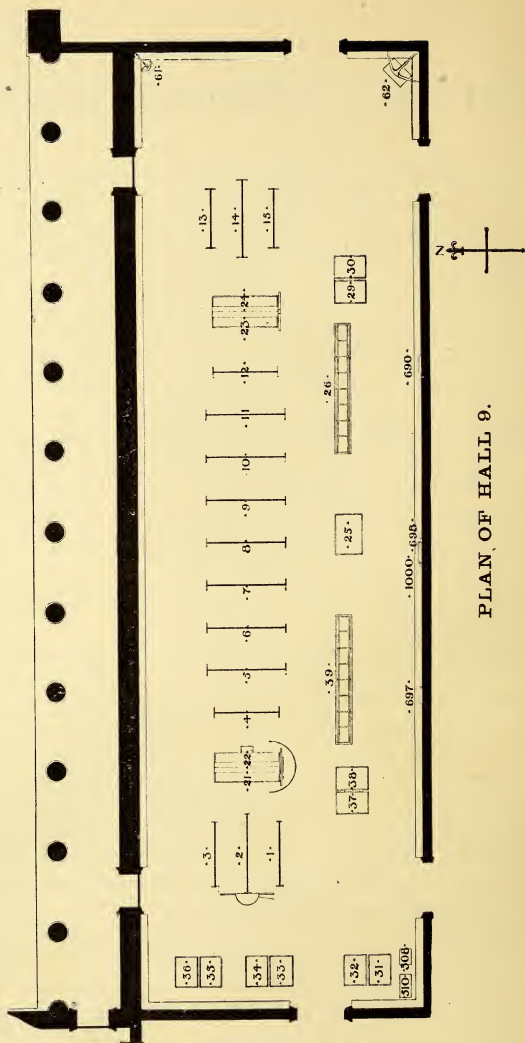
The collections comprise original manuscripts of Columbus and his time, and documents from the Vatican that first saw light in America during the Exposition; maps and charts, showing the earliest works of cartographers; books and pictures illustrating the growth and development of geographical knowledge; portraits and busts, showing the different conceptions regarding the appearance of Columbus in life; monuments, inscriptions, tablets, referring to his remains; nothing has been omitted that would throw light upon the career and personality of the discoverer of America.

Every picture is here with a purpose; every map, chart, relic is a link in the chain connecting the history of the New World with the Old. The student, the historian, the antiquarian, will find in them material for months of study.

In the installation of this collection in its present quarters an effort has been made to follow as closely as possible that historical sequence which is given each article in the descriptive catalogue, which will be issued later, and the numbering is entirely with regard to that sequence.

Owing to the limitations of space, the adapting of the exhibit to the space, and the peculiarity of the exhibit itself, it has been impossible to have the numbers follow each other very closely, or to keep the different groups intact. It is hoped that the suggestions as to order of inspection may assist the visitor in gaining an intelligent comprehension of the whole.

The three rooms situated in the northeast corner of the main building of the Museum Halls 1, 8, and 9 are devoted to this collection. Entering from the East Court, and passing through to the center and largest room of the three, the visitor will do well to inspect, first:



PLAN OF HALL 9.

HALL 9.

Screens 1 and 2.—Pictures, maps, and charts relating to the geographical knowledge, and the science of navigation at the time of Columbus.

Screen 3.—Is a continuation with additional pictures relating to the Court of Ferdinand and Isabella. On the walls of this hall, commencing at the northwest corner, and following around the room, things relating to, and scenes associated with, the early life of Columbus, his career in Spain, his voyages, discoveries, triumphant return, his last days, and his death are to be found.

In connection with the above, attention should be given to

Cases 21 and 22.—The doors and shutters of the house occupied by Columbus at Porto Santo, Madeira Islands.

Case 23.—Replica of the doors that guard the cell in which are held the alleged remains of Columbus, in the Cathedral of Santo Domingo.

No. 343.—Facsimile of a cross erected by Columbus in 1494 after a victory over the Indians, made from the beams of the castle in which Columbus was confined.

Case 24.—Original door and jamb from the monastery of La Rabida, near Palos, Spain.

No. 61.—The anchor of Columbus is in the northeast corner of the room.

No. 62.—Sixteenth century anchor; ancient anchor extremely old type, which had laid in the mud on the east bank of the Ozama river for centuries, and, according to tradition was the property of Don Diego Colon.

Case 25.—Facsimiles of the Casket and Lead Case in which the alleged remains of Columbus are contained. Key to the house at Porto Santo, Madeira Islands, where Columbus lived shortly after his marriage. Bricks and tiles from the original Monastery of La Rabida, near Palos, Spain. Some of them are supposed to be sixteen centuries old.

Case 26.—Various articles of interest from the first settlements founded by Columbus. No. 614.—Original and modern reprint of the Guiliano Dati poem. On the 25th of October, 1493, there was printed at Florence, a metrical translation of the Sant-

angel letter. The author was Guiliano Dati, Bishop of Saint Leone, born at Florence in 1445, and the author of several poems, which are among the rarest of bibliographical curiosities.

On a large pedestal (51), in the next hall beyond Hall 8, will be found one of the guns planted near the palace of Diego Columbus at Santo Domingo in the year 1509, being one of the largest guns that could be procured at that time, and placed there to destroy the palace at the first sign of insubordination on the part of Diego Columbus by the council sent over to restrain any attempt that might be made to establish an independent government. On pedestal (52) is a pile of stone, brick and tiles which represents all that remains of the town of Isabella, the first civilized settlement of the New World founded by Columbus on his second voyage in 1493.

Returning to the main hall (Hall 9),

Screens Nos. 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13 should now be inspected in the order given. Here will be found facsimiles of letters written by Columbus, pictures, maps and charts relating to the publication of the discovery, the christening of the continent, the conquest of Mexico and Peru, and the settlement of other portions of America.

Cases 29 and 30.—Rare books in connection with the above. No. 623—First Biography of Columbus ever published. No. 621—The first published portrait of Columbus. No. 627—One of the first books published concerning the West Indies. No. 624—Life of Columbus, by his son, Fernando. No. 635—The 1511 edition of Ptolemy. No. 620—The book of Philopono; a curious description of the new world by a benedictine monk. No. 605—Facsimile of the letter of Columbus to Rafael Sanchez. No. 622—Manuscript copy, in Latin, of Ptolemy's *Cosmographiæ*, 1504. Case 30—Illustrated Spanish Missal of the 15th century, from a Franciscan convent in the interior of Peru.

No. 690.—Also on the South wall. Portraits of Gautrin Lud, founder of the Gymnase Vosgien, which christened America.

No. 698.—Portrait of Jean Basin of Sandaucourt, the second member of the Gymnase.

No. 697.—Portrait of Matthias Ringman, Member of the Gymnase Vosgien, who carried the letter of Americus Vespucius, which, when translated, christened the New World

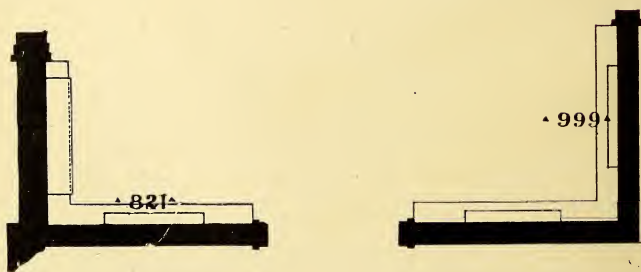
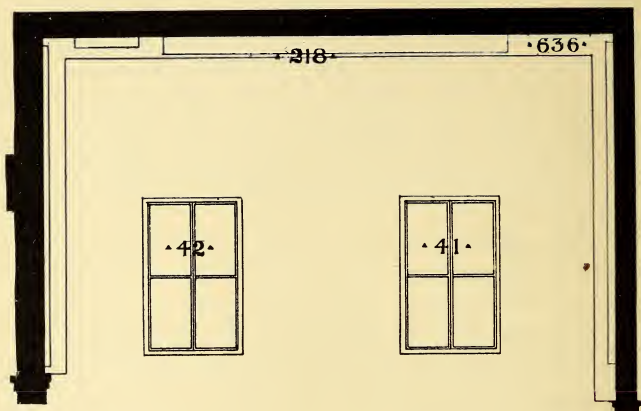
No. 1,000.—Copy of the Borgian map of the World, made by Diego Ribero in 1529.

A beautiful and complete map of the Old and New World.

It was divided into two parts, in conformity with the terms of the compact between the Sovereigns of Spain and the King of Portugal at Tordesillas in 1494. On either side of the line of demarcation are the banners of Spain and Portugal reaching America on the coast of Brazil.

Cases 31, 32, 33, 34, 35, 36, 37, and 38.—Photographs of the original papers and documents relating to Columbus, owned by the Duke of Veragua and the Duchess of Berwick and Alba.

Case 39.—A part of the Vatican exhibit, and contains facsimile of documents relating to the early history of America taken from the famous series of papal registers which are preserved in the secret archives of the Holy See at the Vatican Palace. The rest of the Vatican exhibit is to be seen in the adjoining smaller room to the west, and consists of valuable historical documents and objects of art in the archives of the Vatican, loaned by His Holiness Pope Leo XIII.



PLAN OF HALL 1.



HALL 1.

Cases 40 and 41.—The remaining facsimile reproductions of famous documents.

Album containing specimens of ancient writings from records of the Roman Pontiff, from Innocent III to Urban V.

Facsimile in phototype of the Vatican Greek Bible.

Aquarelles, or water-colors, representing paintings in the Roman Catacombs.

The codex of the prophets, and several other valuable books may be seen.

The mosaics on the wall of this hall belong to the Vatican exhibit; the smallest one—St. Peter Weeping—is considered a masterpiece, the finest mosaic in the world. Its execution required six years' labor. The largest one—the Prophet Isaiah—is after the original fresco painted by Raphael in the church of St. Augustine. Its execution required sixteen years of labor.

The collection of Byzantine Madonnas, hanging in this hall, of which a full description will be found in the catalogue, were painted from the XII to the XVI centuries, and are very valuable.

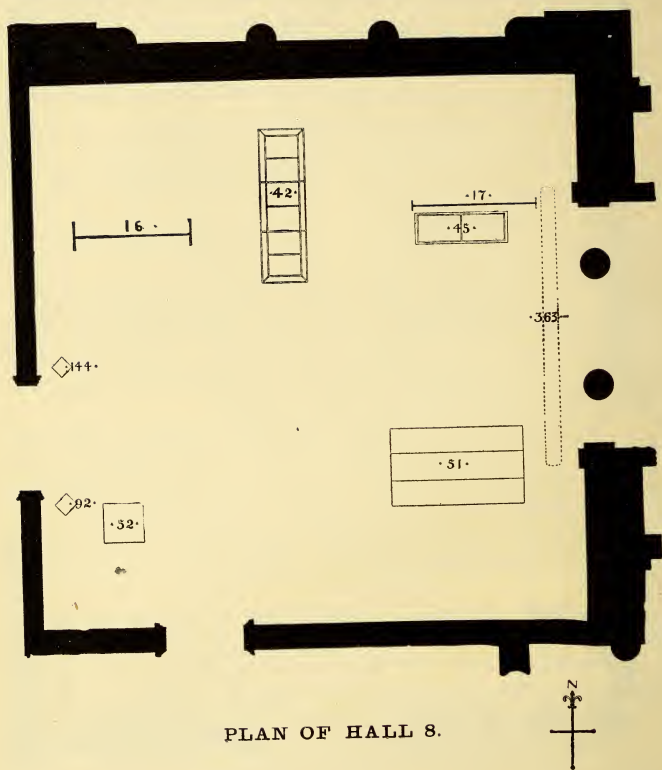
No. 999.—Portrait of Sovereign Pontiff Alexander VI gazing in adoration toward Jerusalem. Reproduced from the original fresco by Pinturecchio, 1494, in the Appartamento Borgia at the Vatican.

No. 636.—Portrait of Bartholomew de Las Casas, the most famous of the historians of the time of Columbus.

No. 821.—Don Juan Marcelo Chequanthopa, descendant of the Incas of Peru, Governor of San Geronimo, 1684.

No. 218.—Landing of Columbus, by Gabrini, of Rome, 1892.

If the visitor will now proceed to Hall 8, as indicated on the accompanying diagram, he will find the portraits and monuments of Columbus.



PLAN OF HALL 8.

HALL 8.

Screens 16 and 17.—Early pictures of America from De Bry's voyages, and from *Description de L' Univers*, by Allain Manesson Mallet, Paris, 1633; also other pictures of scenes associated with the voyages of Columbus, for which room could not be found in Hall 9.

Northeast Wall.—Portraits of descendants and the genealogy of Columbus.

Stands Nos. 51 and 52.—The large cannon and pile of stones already referred to in connection with Hall 9.

No. 857.—Buccaneer cannons from Tortola, West Indies. These cannons are supposed to have come from one of the pirate ships landed here in the 17th century.

Case 42.—Articles of historical interest from Costa Rica and the West Indies.

Case 45.—Collection made by George F. Kunz of Columbus and World's Columbian Exposition Medals, Medallions, Jetons, etc., consisting of over 200, among them the Milan, the Tiffany, Numismatic and Archæological Society, the Genoa, and various medals struck by governments, states, dealers, etc., in connection with the World Columbian Exposition and the Columbian year.

South Wall.—Portraits of Columbus.

The several pictures which are intended to represent the real or ideal Columbus may be grouped into four classes, as follows:

1. Those of Giovio type—either copies of the portrait which hung in the gallery of the Archbishop of Como, or drawn from verbal descriptions given of the Admiral by his contemporaries.
2. The De Bry type, representing Columbus as a Dutchman.
3. The portraits with beards and costumes of the century subsequent to his death.
4. The fanciful pictures without pretense to authenticity.

North Wall. The monuments of Columbus.

There are twenty-nine statues and monuments to Columbus in America, six in Spain, seven in Italy.

No. 363.—Dug-out. Type of boat used by natives.

THE WEST COURT.

The large objects in the West Court form a part of the Natural History collections.

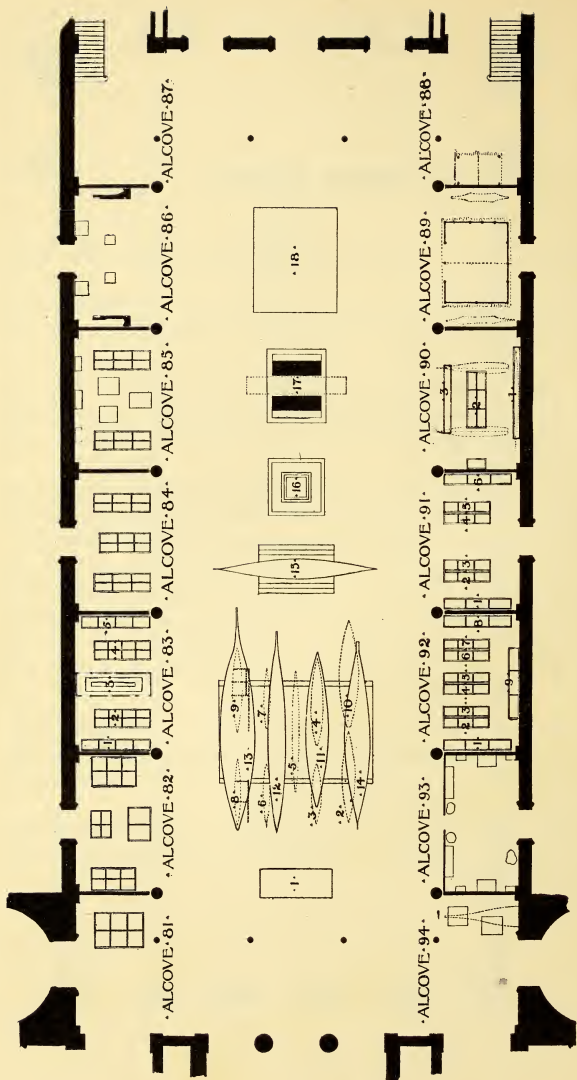
The arrangement is intended to typify to some extent the beginnings and development of vegetable and animal life upon our planet.

The series begins near the west door with the terra cotta pavilion, composed entirely of earth, and containing a vase of the same material in which low forms of vegetation, Lichens and Mosses, are growing.

Next to it, emblematic of forest growth, stands a section of an immense California Redwood Tree, 878 years old, and nearly fifteen feet in diameter, which was 69 inches in thickness when Columbus discovered America, 1492. Upon either side of it stand two sections, one of Western Spruce, seven feet in diameter, and the other of Oak which illustrates chronologically, the comparative rapidity of ring growth in trees; while upon the four corners of the dais are installed living specimens of four principal forms of tree life.

Following in order are the skeleton of the Mastodon, from America, and the reproduction of the huge Mammoth, sixteen feet high, found in Siberia, and the skeleton of a whale; these exemplify land and marine animal life.

Two large rocks, grooved and polished by glacial action and belonging to the Geological Collection will be found under the skeleton of the whale.



PLAN OF EAST COURT.

THE EAST COURT.

Separated from the West Court by the Columbian Rotunda, a memorial of the greatest of expositions, is a series arranged to show human progress during four centuries.

A plaster group, representing an Indian armed with primitive bow and arrow, killing the buffalo upon the prairie, stands next to the rotunda.

A fine series of representative primitive boats, the earliest appliances for inter-communication, come next, while close by is a gondola of the most modern type, of fine design and luxurious furnishing, ready for service, manned by two gondoliers in gay apparel.

Next on the east is the figure of Vulcan, of hammered copper, and of heroic size, which stands upon a pedestal composed of sections of iron beams artistically arranged, typifying man's strength and skill in utilizing the products of the mineral kingdom.

The modern methods of transmitting great power at high speeds, is represented by the immense wooden pulley, 18 feet in diameter, the largest of its kind, flanked by a large steel gear wheel.

Full size models of the locomotives of Trevithick and Stephenson, whose names will ever be associated with the invention of the locomotive, stand near the east door. They illustrate man's conquest over the elements in our century, by applying the generated forces to inanimate matter, and complete the series.

THE NORTH COURT.

In the North Court stands the handsome model of the Reichstag (the German Parliament house), presented by the Imperial German Commission. This model, which is one of the handsomest of its kind, and complete in every detail of architecture and sculpture, is 19 feet wide by 21 feet long, and stands 9 feet high. It recalls the magnificent exhibit made by the German government at the Exposition.

THE SOUTH COURT.

In the South Court are installed full-sized reproductions of antiquities from Yucatan and Central America, more fully described under the Department of Anthropology, page 127.

DEPARTMENT OF GEOLOGY.

DIVISION OF SYSTEMATIC GEOLOGY.

The Division of Systematic Geology embraces those collections which illustrate the history of the earth's development and the materials of its crust. The selection and arrangement of specimens for this purpose has been made upon a basis of scientific rather than economic importance, since the latter phase of the subject is represented by the Division of Economic Geology and Metallurgy. The educational purpose of such collections has also been kept in mind, so that in general it may be said that most of the objects and phenomena described in any good text-book on geology, are here represented, either by actual specimens or by models. On the other hand, such works may be referred to for a fuller description of any of the specimens or discussions of the subjects presented.

The collections are divided into six sections, located as follows:

Paleontology : Halls 35, 36 and 59.

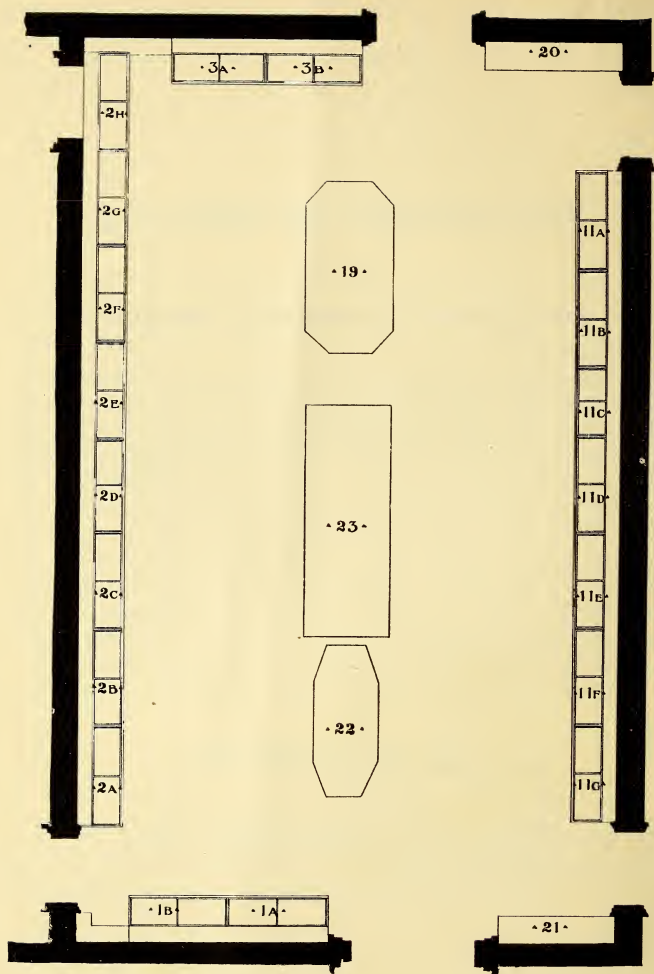
Physiographic Geology : Halls 60 and 61.

Meteorites : Hall 62.

Systematic Mineralogy : Halls 63 and 64.

Structural and Dynamical Geology : Hall 65.

Lithology : Hall 66.



PLAN OF HALL 35.



HALLS 35, 36, AND 59.

PALEONTOLOGY.

The section of Paleontology is located in Halls 35, 36, and 59. Here, by fossils, casts, and models, are illustrated the animal and vegetable forms which have characterized the life of the globe at the succeeding stages of its history. The arrangement is chronological, and the order to be followed in a study of the collection is indicated by the numbering of the cases. The series begins in Hall 35, at the left of the entrance from the west court, passes along the west wall, the south wall of Halls 36 and 59, then to the other side of the same rooms, and back to the right of the entrance to Hall 35. The larger specimens in the center of the halls it was impracticable to place in chronological order, but the specimen labels show the period to which each belongs. All the specimen labels show: 1st, the name of the species, together with that of the authority by whom named; 2nd, the geological period or epoch to which each belongs; and 3rd, the locality. Wherever a cast is shown, the fact is indicated by the label, so that it may not be confounded with actual specimens. The visitor will find it interesting to note the characteristic forms of life of the different epochs, and the increase in number and variety of species as the earth's history advanced.

Case 1A, Hall 35.—Laurentian. The only fossil illustrating this period is the problematic *Eozoön Canadense*, several specimens of which are shown. It is thought by some to represent the fossil remains of a gigantic Rhizopod, but is generally considered to be of wholly inorganic origin.

The remainder of Case 1 and part of Case 2.—Fossils the Silurian age, or age of Invertebrates. Here we find all of the great types of animals represented except the Vertebrates; the Protozoa by *Sponges* and *Rhizopods*; the Radiates by *Graptolites* and the *Crinoids*; the Mollusks by *Pteropods*, *Gasteropods*, and *Cephalopods*; the Articulates by *Crustaceans* and *Worms*.

Plants are represented by *Fucoids*.

Case 1.—Fossils of the Cambrian and early Silurian periods. Several genera of Trilobites: *Paradoxides*, *Asaphus*, *Olenellus*, and *Agnostus*. This crustacean is related to the horse-shoe or king crabs of the present day, and is an abundant fossil in this age. The track of a Trilobite, *Climatichnites*, is shown by a cast in Case 1A. Worms are represented by the borings and tracks of *Scolithus*. The Honey-comb Corals by *Favistella*. Graptolites by several genera—*Diplograptus*, *Climacograptus*, etc. These are hydroids, the delicate plume-like nature of whose remains has given them their name, which is derived from the Greek word meaning “to write.” They are common fossils of this era. Sponges are represented by *Receptaculites*.

Between Cases 1 and 2, a cast of an *Orthoceras*, nine feet in length. This shows the size which these Cephalopods, represented at the present time by the Nautilus, attained in early times. They were a striking feature of the Palæozoic era.

Cases 2A, B, C, D, E, F.—Fossils illustrating the life of the remainder of the Silurian age, arranged according to periods in chronological or stratigraphic order. Only the more typical and abundant forms will be mentioned here. Plants, represented by large slabs of *Arthropycus* and *Bythotrephis*. These are generally supposed to be imprints of the leathery stems of seaweeds, but by some are thought to be markings of worms. Stems and bodies of Crinoids—*Glyptocrinus*, *Agelacrinus*, etc. These are the most abundant Echinoderms of the early seas. Mounted upon a jointed stem and with many branching arms, they well deserve the name of Sea Lilies. Cup corals—*Eridophyllum*. Chain Corals, represented by *Halysites*.

Ordovician Trilobites—*Asaphus*, *Illænus*, *Dalmania*.

Many genera of Brachiopods, of which the following exist to the present day, and may be seen in the Department of Zoology. Hall 25—*Lingula*, *Rhynchonella*. Brachiopods are sometimes called lamp shells, on account of their resemblance to a Roman lamp; the two valves of the shell are unequal in size, and the beak of the larger curls over on that of the smaller. Though found only in small numbers at the present day, they were in Silurian times the most abundant and characteristic form of marine life. They are allied to the Worms in structure.

The Gasteropods, or univalve mollusks, are represented by

Maclurea, *Bellrophon*, *Pleurotomaria*, etc. The Cephalopods by many specimens of *Orthoceras*. In above Case 2D will be seen a drawing illustrating this Mollusk as it was situated in its shell. Living in the outer chamber, a long siphuncle connected the animal with the other sections. In the process of geological time shells of this type gradually become coiled and the partitions between the chambers become more and more complex, reaching greatest development in the Ammonites of the Cretaceous period. The class then diminishes in size and number, and are represented at the present day only by a few species of the Nautilus.

Several specimens of *Eurypterus*, of the class of Crustaceans. These are large Entomostracans, having their nearest representatives in the Cyclops of the present day.

Cup Corals represented by *Cyathophyllum*.

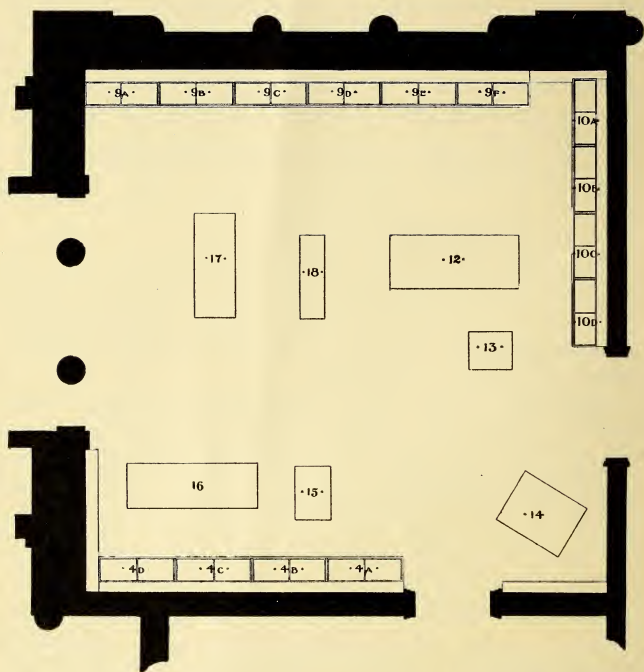
Case 2E.—Straight hinged or square shouldered Brachiopods, represented by *Spirifera*. This is a common genus through nearly all geological history, and still exists. Other Brachiopods are *Rhynchonella* and the large and characteristic *Pentamerus*. Trilobites—*Phacops*, *Dalmanites*.

Case 2F.—Cephalopods of the *Orthoceras* family—*Phragmoceras*, *Gomphoceras*. It will be noted that Mollusks, Brachiopods, Crinoids, and Corals make up the larger part of the life of this age.

Cases 2G, H and 3.—Fossils of the Devonian age, or age of fishes. Here, for the first time in the earth's history, vertebrates appear. They are fishes belonging to the two orders of Ganoids—represented in the present day by Gar-fish and Sturgeon—and Placoids, represented by Sharks, Skates, and Rays.

Cases 2G and H.—Star fishes, or Asteroids, represented by *Furcaster* and *Ræmeraster*. They are free moving Echinoderms, not attached like the Crinoids. Cup Corals are represented by several species of *Zaphrentis*. Sponges by *Dictyophyton*, large masses of which will be seen in this case. Other invertebrates of types already mentioned. *Pterichtys* and *Coccosteus*, fishes of the order of Ganoids.

Case 3.—One of the earliest representatives of land plants—*Psilophyton*. This belongs to the group of Lycopods, or club mosses. The Cephalopods are represented by *Goniatites*. They belong to the same type as *Orthoceras*, but are coiled and the junction of the septa and shell (suture) is zigzag instead of straight.



PLAN OF HALL 36.



The siphuncle, too, is dorsal rather than central. Corals—*Michelinia*, *Favosites*, *Heliophyllum*. Brachiopods—*Spirifera*, *Orthis*, *Atrypa*. Trilobites—*Phacops*, *Dalmania*, *Homalonotus*. Fishes—*Glyptolepis*. *Diplopterus*.

Cases 4A, 4B, 4C, 4D, and 5A.—Fossils of the Carboniferous Age, or age of coal plants. Naturally land plants are the striking features of this age. They belong to five great families: Conifers, Ferns, Lepidodendrids, Sigillarids, and Calamites.

Cases 4A, 4B, 4C, 4D, Hall 36.—*Cordaites*. This tree is allied to the Conifers, and had probably a straight trunk 60 or 70 feet in height. *Trigonocarpum*, in the same case, is supposed to represent its fruit. Ferns are represented by *Pecopteris*, *Neuropteris* and others, many imprints of sections of the fronds being shown. These frequently form the center of clay concretions, as shown in some which have been broken open. Sections of trunks of *Lepidodendrids* and *Sigillarids*. One of the latter shows by its size that the trunk of the original tree must have been many feet in diameter, and perhaps 80 to 100 feet high. *Stigmaria*, which were probably the under-water stems of the Sigillarids.

The animal life of this period is characterized by the abundance of Crinoids, as they reached their highest development at this time. Many specimens are shown in this case, including *Platycrinus*, *Scaphocrinus*, and *Pentremites*, a Blastid or bud Crinoid. Corals were also abundant, as represented by the columnar *Lithostrotion*, a true polyp coral, and *Dibunophyllum*, some polished slabs containing which are shown. The cork-screw like Bryozoan *Archimedes* is illustrated by several specimens. *Spirifera* and *Productus* are the leading genera among the Brachiopods. The Gasteropods, univalve mollusks, are represented by *Bellerophon* and *Pleurotomaria*. *Melonites*, in the upper part of Case 4, was an Echinoïd allied to the sea urchin of the present day; they differ from the latter, however, in having large plates and small spines. The cast on the wall shows the foot-prints of one of the first reptiles, *Sauropus*. This was a four-footed, crawling animal, with thick, fleshy feet about 4 inches long.

Case 5A, Hall 59.—Permian, or closing age of the Carboniferous. Fishes are represented by the *Palæoniscus*. Reptiles by the *Archegosaurus*, an animal which combined the characters of reptile and fish, having both lungs and gills, and being covered

with scales. Plants are represented by leaves of the *Walchia*, a Lycopod. The fossils of the Carboniferous Age are especially numerous in the State of Illinois, and a good description of them can be obtained from the report of the Geological Survey of Illinois, Volume II, which may be found in the Library.

South and West Walls of Hall 36.—Large slabs and casts showing tracks of reptiles of the Triassic period. Little is known about these animals, except so much as can be learned from their foot-prints. The *Brontozoum* was a three-toed animal, probably at least 14 feet in height, and had a stride of over 3 feet. *Cheirotherium* (South Wall, Hall 59) was so named from the resemblance of the foot-print to the human hand. It was a four- or five-toed reptile, probably of the order of the Labyrinthodonts. A cast showing the shape of the skull of the latter animal may be seen at the right.

Cases 5, 6, 7, part of 8, and Walls of Hall 59.—Fossils of Mesozoic Time, the age of reptiles. This age is characterized by the number and size of its reptiles, especially Amphibians. Here, too, are introduced the first mammals, birds, and fishes of the modern type, and among plants the *angiosperms*.

Cases 5A and B.—Triassic fossils. Many of the types of the Carboniferous age continue to be prominent. *Equisetum*, belonging to the family of Equisetæ, or "Horsetails" of the present day, and *Pterophyllum*, of the order of Cycads, were most prominent among the land plants, and are illustrated by many specimens. Among the Lamellibranchs, the modern genus of *Modiola* is introduced. *Ceratites* represents the Orthoceras of early times, from which it will be seen to differ in being coiled, and in having a more complex suture.

Cases 5C, D, E, F, G, 6, 7, 8A, B, C, D, and Walls of Hall 59.—Jurassic fossils.

This is the period when the class of reptiles reached its greatest development. Other interesting fossils are found, however. (Cases 5D, E, F, G). Among plants Cycads are illustrated by several specimens of *Cycadoidea*. Conifers and Ferns are also shown. Among Invertebrates the beautiful Crinoid *Pentacrinus*, three specimens on the south wall, is especially notable. Other Echinoderms are *Cidaris*, *Hemicidaris*, *Pygaster* and *Clypeaster*, the two latter being allied to *Clypeus* or "sand dollar" of the present day.

Brachiopods, mostly of the sloping shoulder type, illustrated by the genera *Terebratula* and *Rhynchonella*. Among bivalve mollusks the modern genus of *Ostrea*, or oyster.

Imprints of Insects on the lithographic slates. These lithographic slate beds afford a large number of beautifully preserved specimens, as this stone is especially adapted for such preservation. Other Articulates, of the class of Crustaceans, from the same beds, *Limulus*, *Æger*.

Case 6.—Ammonites, remarkable for size and complexity of suture. Many specimens are shown, including the genera *Cardioceras*, *Arietes*, *Grammoceras*. Some of the *Arietes* are 3 feet in diameter. The sutures of some specimens have been painted to bring out the markings. Many specimens of *Nautilus* and allied Cephalopods.

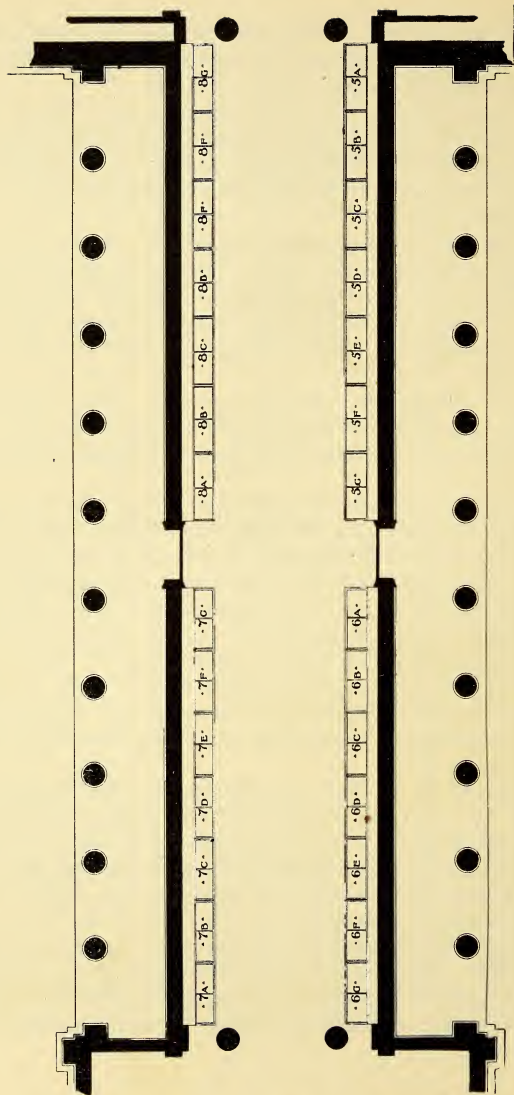
Case 7.—*Belemnites*. These are allied to modern Cuttle-fish and Squids. The only part of the animal usually preserved is the internal bone, or pen. Two restorations of the original animal are shown.

Ichthyosaur, *Plesiosaur*, and *Pliosaur*. These are great marine reptiles, whose remains are common among the rocks of this period. They are here illustrated by a large number of specimens and casts. Restorations of the first two may be seen in the Alcove at the entrance of Hall 35. A complete head of an *Ichthyosaur* from England is placed between Cases 5 and 6. The animal was sometimes 30 to 40 feet in length, and had enormous eyes—sometimes 15 inches in diameter. The vertebrae were concave and fish like, and the animal combined many characteristics of the fish and reptile. The *Pliosaur* was an animal of the same type, even larger than the *Ichthyosaur*.

Cases 8A, B, C, D.—The *Dinosaurs*, or land reptiles, are illustrated by bones and vertebrae of the *Teleosaur* and casts showing various parts of the *Megalosaur*. *Pterosaurs*, or flying reptiles, are illustrated by imprints of wings of the *Rhamphorhynchus*, an animal not unlike the bat in appearance, and by casts of the remains of *Pterodactyls*.

Cases 8E, F, G, and 9.—Fossils of the Cretaceous period.

Case 8E.—Here we find the first of modern plants, or *Angiosperms*. Imprints of leaves are shown, many being modern genera, such as *Sassafras*, *Populites*, or poplar, *Betulites*, or birch and *Viburnum*.



PLAN OF HALL 59.

Cases 8F and G.—Among bivalve mollusks the order of *Rudistes* is unique, and characteristic of this period. In shells of this order one valve is enormously enlarged, and somewhat funnel shaped; the other valve is small and acts as a lid—*Hippurites*, *Sphærulites*, *Radiolites*. *Inoceramus* also belongs to this order, and sometimes reaches enormous size.

Casts, much enlarged from the original, illustrating the forms of *Foraminifera* whose shells make up the vast deposits of chalk which characterize this period.

Along with these deposits are flint nodules formed from the siliceous spicules of sponges, and many fossil sponges are preserved—*Siphonia*, *Cyclolites*.

West Wall of Hall 36.—*Ventriculites* are enormous sponges of this period.

Case 9, Hall 36.—Among Echinoids, the free moving forms are vastly in excess of the stemmed—*Holaster*, *Toxaster*, and *Ananchytes*. Among Cephalopods are specimens of the *Nautilus* of the modern type; also members of the *Ammonite* family, which take on various and intricate forms, and many are of great size. All grades of shape are found, from the straight shelled to those of hook shape, partly uncoiled spirals, spirals, etc. The genera are named from their characteristic forms, some of them being as follows: *Baculites*, rod shaped, one specimen 3 ft. long, West wall of Hall 36; small *Baculites*; *Hamites*, hook shaped; *Helicoceras*, an open spiral; *Macroscaphites*, boat-shaped; *Turritites*, tower-shaped.

Agassiz describes these forms as representing the death contortions of this remarkable family. The term is an appropriate one, since with this age they become extinct.

Lamellibranchs and *Gasteropods*, illustrated by many specimens, mostly of modern types—*Ostrea*, or oyster, of many and curious shapes, *Pecten*, *Vola*, *Exogyra*, *Gryphaea*, etc.

North Wall of Hall 36.—Cast of head of *Mosasaurus*, the sea serpent of ancient times. This was a swimming, snake-like reptile, probably 80 feet in length. Its vertebrae are illustrated by a cast, Case 9E.

Cases 9F, 10 and 11.—Fossils of Cenozoic time, or age of mammals, divided into the Tertiary and Quaternary periods.

Cases 9F, 10 and 11A and B.—Tertiary fossils.

Case 9F.—*Flabellaria*, leaves of a palm which grew in the Eocene epoch near Green River, Wyoming. Also, leaves of *Acer*, or maple, and other modern plants.

Nummulites—There are abundant and characteristic fossils of this period. They are shells of a Rhizopod, and in Europe and Africa form limestones many thousand feet in thickness.

Case 10.—Among univalve mollusks many modern types will be recognized—*Turritella*, *Natica*, *Cerithium*, *Strombus*, and others.

Fishes belonging to the order of *Teleosts*, or osseous fishes, are illustrated by many specimens from the Green River beds—*Priscacara*, *Diplomystus*, etc. These are of modern types and related to the perch, herring and the like.

Sharks of enormous size also existed. Teeth of the *Carcharodon* are common fossils, and specimens may be seen in this case.

Floor of Hall 36, Pedestal 13.—A restoration showing the jaws of *Carcharodon* and within these, for comparison, the jaws of a modern shark. The ancient *Carcharodon* was probably 50 to 70 feet in length.

Pedestal 12.—Restoration of *Hadrosaurus* from the Upper Cretaceous of New Jersey. This was a huge land reptile, 28 feet in length, allied to the *Iguanodon*. It was probably a vegetable feeder, and able to stand and walk after the manner of birds.

Pedestal 14.—Cast of the skull of a *Mastodon* from the Miocene beds in the Sewalik Hills, India. Behind it, a femur of the same animal, and head and femur of *Diprotodon* (cast).

Pedestal 15.—Head of the *Dinotherium* (cast). This was a huge animal with a skull three feet long, herbivorous, and remarkable for two long tusk-like teeth, projecting downwards. It combined the characteristics of the elephant, hippopotamus, tapir, and dugong. A cast of its femur may be seen near by.

Pedestal 16.—A restoration of the skull of the *Elephas ganesa*, one of seven species of elephants existing during the Miocene epoch in India. It is remarkable for the length of its tusks, those of this specimen being ten feet long.

Pedestal 17.—Restoration of a skeleton of *Dinoceras*, from Wyoming. This was a five-toed Ungulate of elephantine size, but having no proboscis, and probably like the rhinoceros in its habits. It is marked by three pairs of protuberances on its skull

which probably bore horns. In spite of the size of the animal its brain capacity was very small—only one-eighth that of a modern horse, as shown by a cast, Case 11D.

Pedestal 18.—Skeleton of *Irish Elk*, from Limerick, Ireland. A Post-Pliocene mammal of the Deer family, the bones of which are found in marl beneath peat beds in Ireland and England. The antlers of this animal have a spread of seven feet, and its height was nearly eight feet.

Case 11, Hall 35.—Tertiary and Quaternary fossils.

Case 11A.—Fossil turtles of the Tertiary period, including carapaces of *Styemys* from Nebraska and of *Testudo*, from South Carolina; also turtle's egg from France.

Cases 11B and C.—The Cetacea, or whales of this period, are illustrated by vertebrae of the *Zeuglodon*. These animals were probably 70 feet in length. Their bones are so common in many places in the south as to be used by farmers for building fences.

Many remains of mammals from the Green River, Wyoming, beds, including skulls of the *Oreodon*, an animal which has been described as "a ruminating hog," and jaws, vertebrae, and limb bones of the *Titanotherium*, an animal allied to the *Dinoceras*. Also, skulls of the *Mesohippus*, a three-toed mammal about the size of a sheep, believed to be one of the ancestors of the modern horse.

Cases 11D and E.—Quaternary fossils. Leg bones of *Eurypteryx*, *Mesopteryx*, and other birds. These were post-glacial birds living in New Zealand. Large shells of *Ostrea*, or oyster, from the marl beds of North Carolina. Other invertebrates of this age.

Case 11F.—Bones of the post-glacial Hippopotamus, which lived at this time in England. Leg Bones of the Bison, from the same region.

Case 11G.—Teeth of ancient elephants—*Mammoth* and *Mastodon*. Skull of *Rhinoceros* (cast).

Carnivores, illustrated by skull of *Ursus* (cast), or ancient bear. Remains of *Homo sapiens*, or man, found in a cave on the island of Crete—probably very ancient.

Floor of Hall 35, Pedestal 19.—Restoration of *Glyptodon clavipes*. This was a giant Edentate, allied to the Armadillo. It existed during Quaternary times in South America. The specimen is 10 feet in length, the shell having a length of 5 feet.

Pedestal 23.—Restoration of *Megatherium Cuvieri*. This was another South American Edentate of the Quaternary epoch, which had one hundred times the bulk of any living species of this order. It had a wide range during this period, bones being found as far north as South Carolina. It was a huge, clumsy beast, its enormous femur, three times as thick as an elephant's, being used for supporting the animal while with its fore limbs it tore down branches of trees for food.

Pedestal 22.—Restoration of *Colossochelys atlas*, one of the huge turtles of the Tertiary period.

North Wall of Hall 35, Pedestal 20.—Leg bones of *Dinornis*, a huge wingless bird which inhabited New Zealand. The tibia is nearly a yard long and as large as that of a horse, and the egg, a cast representing the size of which may be seen in Case 11E, had a capacity of over a gallon. Also casts of limbs of *Sivatherium*, a four-horned antelope of elephantine size.

East Wall.—Casts showing heads of several species of *Bos*, ancestors of the modern cow; also, casts of the remains of a human skeleton found in limestone in Guadalupe.

South Wall, Pedestal 21.—Casts of skulls of several species of elephants of this time, including the *Mastodon*, which was the largest of this class of animals. Casts of skulls of *Toxodon*, *Sivatherium*, *Nototherium*, and other large mammals.

HALLS 60 AND 61.

GEOGRAPHIC GEOLOGY.

The purpose of the exhibit of this department is to illustrate in a vivid and realistic way the surface configuration of the earth. The chief feature of the exhibit is a series of relief maps which reproduce on as natural and representative scales as practicable the topography and structure of selected portions of the earth's surface. A part of the series show only topography and culture, while another part show geological structure as well as topography. To some extent, the topography is shown on one map and the geological structure on another, so that both elements are represented with the greatest distinctness. The portions of the surface selected to be represented are usually such as to portray some typical form of surface sculpturing or of volcanic accumulation. Some, however, represent natural or political divisions.

In addition to the relief maps, there are models showing geological structure or illustrating methods of development. Some of these are dissected so as to show the more intimate structure of the formations. The exhibit also contains a collection of globes, wall maps, portfolios, and other geographic material. The following is a list of the principal features:

No. 1.—Relief Map of the Uinta and Wasatch Mountains, colored to show geological formation. Horizontal scale, 1 in., equals 4 miles, or 1.253440. Vertical scale, 1.126720.

No. 2.—Relief map of the Yellowstone National Park, showing canyons of the Yellowstone and Madison Rivers, etc. Horizontal and vertical scale, 1 in., equals 1 mile, or 1.63360.

No. 3.—Relief map of the region of extinct volcanoes in Auvergne, central France, geological and topographical. Henri Le Coq and G. P. Scrope.

No. 4.—Relief map of the Ice Spring craters, a group of extinct volcanoes near Filmore, Utah, illustrating the successive formation and partial obliteration of craters and lava fields. Horizontal and vertical scales, 1.1200, 1 in. equals 100 feet.

No. 5.—Relief map of Massachusetts, from maps of the United States Geological Survey and the Topographic Survey of

Massachusetts. Horizontal scale, 1 in. equals 4 miles. Vertical scale, 1 in. equals 4000 feet.

No. 6.—Relief map of the United States and the Gulf of Mexico, exhibiting natural contours of the earth's surface. Horizontal scale, 1 in. equals 50 miles. Vertical scale, 1 in. equals 5 miles.

No. 7.—Elementary relief map of England and Wales.

No. 8.—Elementary relief map of Scotland.

No. 9.—Elementary relief map of Europe.

No. 10.—Relief map of the Grand Canyon of the Colorado of the West and the cliffs of South Utah, colored to show geological formations. Horizontal scale, 1 in. equals 2 miles. Vertical scale, 1 in. equals 5000 feet.

No. 11.—Relief map of Eureka District, Nevada, colored to show geological formations. Scale, 1 in. equals 1600 feet.

No. 12.—Relief map of Mount Desert Island, Maine. Scale, 1:40000.

No. 13.—Relief map of Mount Blanc. Horizontal scale, $\frac{3}{4}$ in. equals 1 mile. Vertical scale, $1\frac{1}{4}$ in. equals 1 mile.

No. 14.—Relief map of Yosemite Valley.

No. 15.—Relief map of Mount Shasta, showing topographical features.

No. 16.—Relief map of Mount Shasta, showing geological features.

No. 17.—Relief map of the Chattanooga District, showing topographical features.

No. 18.—Relief map of New Jersey, showing geological features.

No. 19.—Relief map of Palestine.

No. 20.—Relief map of the Arkansas Drainage Basin.

No. 21.—Relief map of Carmel Bay, California, showing submarine valley.

No. 22.—Model of Henry Mountains and vicinity, Utah, showing geological formations and the effects of erosion.

No. 23.—Model showing the Henry Mountains and vicinity ideally restored before erosion took place.

No. 24.—Geological and relief map of the Henry Mountains showing the effects of erosion.

No. 25.—Same as the above, ideally restored before erosion took place.

No. 26.—Model of the Yosemite Valley.

No. 27.—Geological and relief model of Vesuvius and Monte Somma.

No. 28.—Relief model of the Island of Palma.

No. 29.—Model showing irrigation by ditches and furrows on steeply sloping fields.

No. 30.—Relief map of Mount Taylor, New Mexico, showing geological formations. Scale, 1 in. equals 1 mile.

No. 31.—Relief model of Leadville and vicinity, dissected to show geological structure. Scale, 1 in. equals 800 feet, or 1,9600.

No. 32.—Same as above, undissected.

No. 33.—Contour map, in relief, of Washoe mining region, 50 foot contours. Scale, 1:20000.

No. 34.—Geological and relief map of part of Blair and Bedford Counties, Pennsylvania.

No. 35.—Relief map of the Caucasus.

No. 36.—Relief map of the high plateaus of Utah, colored to show the geological structure. Scale, 1:1,680,000.

No. 37.—Relief map of the United States and the Gulf of Mexico, modeled on a section of a globe, 16½ feet in diameter. Horizontal scale, 1 in. equals 4 miles. Vertical scale, 1 in. equals 8 miles.

No. 38.—Geological relief map of Mount Ætna.

No. 39.—Topographic wall map of a portion of the west of Scotland, hatchured. Scale, 1 in. equals 1 mile.

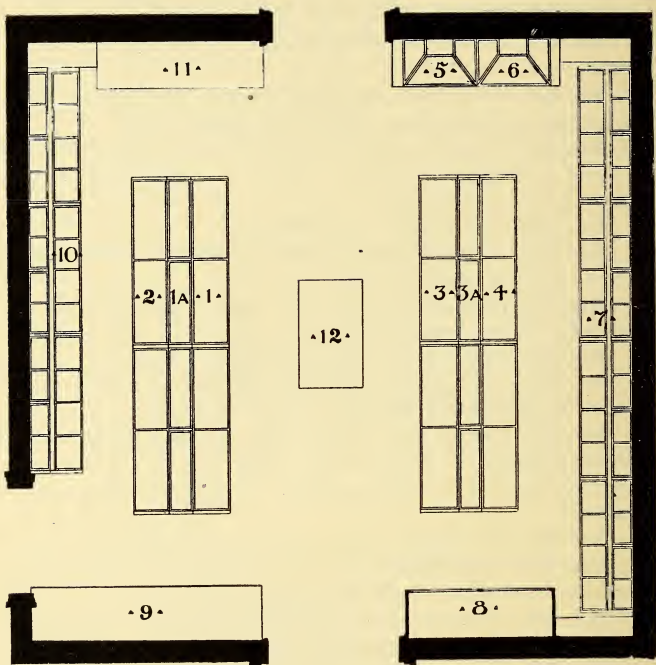
No. 40.—Same as above, without hatchures.

No. 41.—Bacon's library wall map of London and suburbs.

No. 42.—Geological wall map of England and Wales. Scale, 1 in. equals 15 miles.

No. 43.—Hotchkiss' geological wall map of Virginia and West Virginia.

FOOT-NOTE.—Besides small scale maps of France (stereogram hypsometrical, and geological maps), United States, Mexico, Russia, South America, China, Cuba, Arabia, Antilles, and other countries.



PLAN OF HALL 62.



HALL 62.

METEORITES.

The collection of Meteorites includes over 200 "falls," or "finds," represented by 4,077 specimens, which have an aggregate weight of 4,745.6 pounds. Besides these are sixty-three casts or models of notable meteorites. A complete catalogue of the collection will soon be issued. The material at present exhibited has been collected by H. A. Ward, of Rochester, N. Y., and George F. Kunz, of New York City. In the arrangement of the collection the specimens are divided into three classes, viz.: Siderites, Siderolites, and Aerolites. Under each of these divisions the specimens are placed in chronological order, beginning with the earliest, and the labels show the locality, date of fall or find, and weight of specimen.

Cases 1, 1A, and 2.—*Siderites*, These are meteorites composed chiefly of iron, with varying percentages of nickel, and frequently cobalt and manganese. Combined sulphur and phosphorus are also usually present. The surface of the siderites is smooth, as if fused, and more or less indented or pitted. Polished slabs, upon etching with nitric acid, usually show octahedral markings called Widmannstätten figures.

Case 1.—Specimens of earliest fall are irons from Toluca, Mexico, a meteorite found in 1784. Over twenty masses of this are shown, including polished slabs bearing the characteristic etching figures.

Other interesting specimens are sections of the Zacatecas meteorite, 72 grams; nearly 50 grams of the Cosby's Creek, Tennessee, iron; a large mass of the Signet iron, Tucson, Arizona, and a section of the Laurens County, South Carolina, siderite.

Case 1A.—Large masses of the Toluca, Mexico, iron; nearly 2,000 grams of the Bendego, Bahia, Brazil, siderite; 1,396 grams of the Brazos River, Texas, siderite; specimens of the Butcher Iron, Coahuila, Mexico; natural and etched specimens of the Glorietta Mountain, New Mexico, iron. Large masses

of the peculiar meteorite from Santa Catharina, Brazil. These masses have the form of rusty, porous nodules, and, owing to alteration, much resemble certain varieties of limonite. Group of Cañon Diablo, Arizona, siderites, the largest piece weighing 198.5 pounds. Polished and etched specimens of the same. One hundred pounds of the Kenton County, Kentucky, siderite.

Case 2.—A large number of specimens of the Santa Catharina iron, etched specimens of the Joe Wright Mountain siderite, twenty-three grams of the Lea iron, Tennessee; the Floyd County, Virginia, iron, entire, weight 29 pounds.

Cases 3, 3A, and part of 4.—*Aerolites*. These are meteorites made up largely of stony matter. The surface is usually black, smooth as if fused, and somewhat pitted. On breaking the thin black crust which covers the exterior, the interior is generally found to be of a grayish color, with scattered metalliferous particles. Analysis shows these meteorites to be made up largely of the silicates enstatite, olivine, and minerals of the pyroxene group, together with sulphides and phosphides of iron.

Case 3 and part of 4.—The aerolite of earliest date is that from Ensisheim, Germany, which fell in 1492. 26 grams are shown. Other interesting specimens are 200 grams of the stone from L'Aigle, France; 7 grams of the Bishopville, South Carolina, aerolite, remarkable for its light color and its composition of nearly pure enstatite; about fifty stones of the Pultusk, Poland, fall; fragments of the carbonaceous meteorite from Entre Rios, Argentine Republic; and two fragments of the recently discovered Beaver Creek, British Columbia, aerolite.

Case 3A.—Six hundred and nine aerolites of the Winnebago County, Iowa, fall, varying in weight from a few grams each to ten pounds. These stones fell over an area nine miles in extent at 5:30 P. M., May 2d, 1890. Some of the specimens were found in a hay stack. They are each individually perfect aerolites.

Case 3A (West Side).—Large slabs of the Farmington, Kansas, aerolite, which fell June 25th, 1890. Several masses of the Homestead, Iowa, aerolite.

Case 3A (East Side) and part of Case 4.—*Siderolites*. These contain iron and stony matter in about equal proportions. Olivine is frequently found filling the cavities of the iron.

Large slabs (10,985 grams) of the Fayette County, Texas, siderolite; Estherville, Emmett County, Iowa, stone, several large masses; Eagle Station, Carroll County, Kentucky, iron; Atacama, Chile, siderolite; and many others.

Cases 5 and 6.—Siderolite, or Pallasite, from Kiowa County, Kansas, found 1889, nine pieces. The mass in Case 5 weighs 465 pounds, the largest in Case 6, 344.5 pounds. There are also three smaller masses, and three or four slabs cut to show the structure of the iron, the cavities of which will be seen to be filled with olivine.

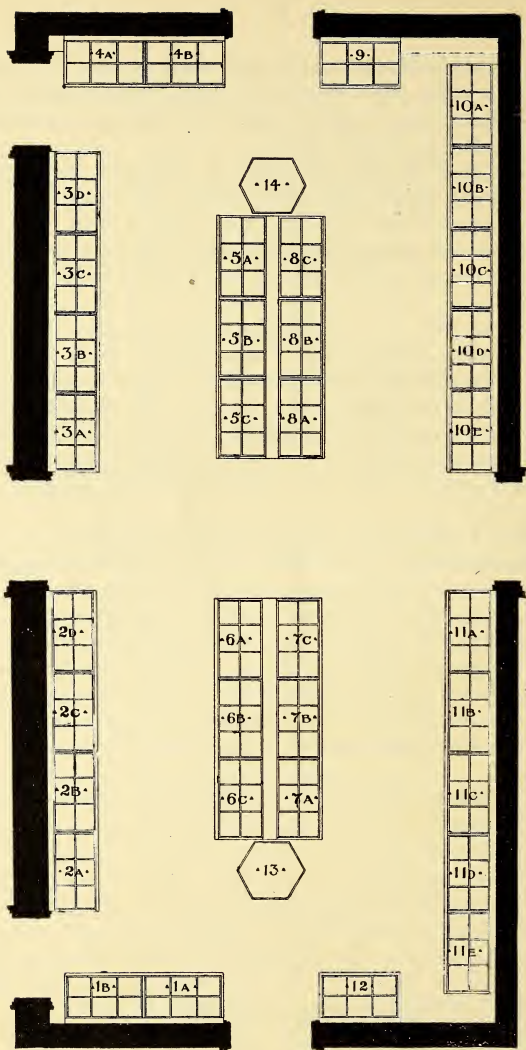
Case 8.—Aerolite from Phillips County, Kansas. One large mass broken into 2,934 pieces. The aggregate weight of these is 1184.5 pounds, making the largest weight of any single meteoric stone known to be collected in one case. The surface will be seen to be deeply pitted and oxidized. The stone as it fell struck upon a ledge, shattering it into a large number of pieces. All that could be found of these were collected, and are shown in this case.

Cases 7 and 10.—Casts of notable meteorites.

Cases 9 and 11.—Models of the enormous Chihuahua, Mexico, siderites, masses which have never been removed from their original position, and have been seen only by travelers.

Case 12.—Two large masses of Cañon Diablo, Arizona, meteorites, weight 1013 and 265 pounds. This locality has recently been discovered and described by Prof. A. E. Foote, and has yielded a large number of specimens. Recent investigations by Mr. Geo. F. Kunz show the presence in these meteorites of minute diamonds.

East Wall.—Map, showing distribution of meteorite falls in the United States.



PLAN OF HALL 63.



HALLS 63 AND 64.

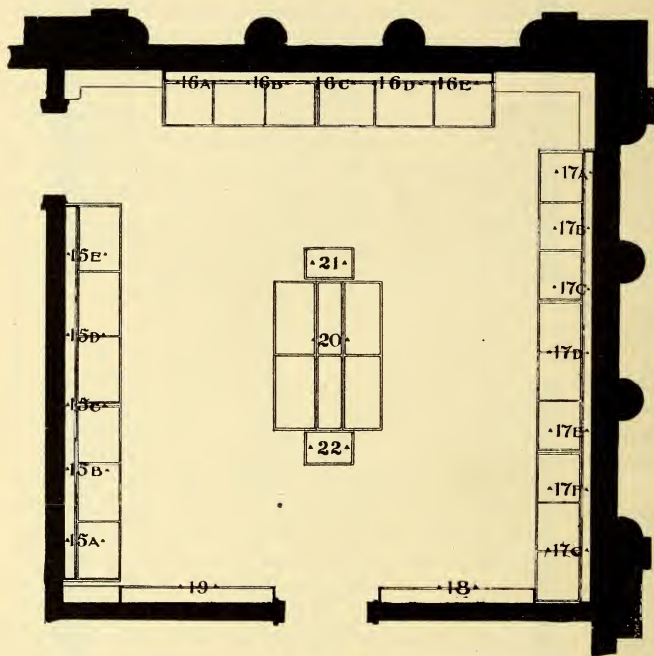
SYSTEMATIC MINERALOGY.

The systematic collection of minerals numbers about 5,000 specimens. The arrangement of the collection is based upon that given in Dana's New System of Mineralogy, and so far as possible the purpose has been to illustrate the different species there described. A copy of this work may be found in the library. The order which is to be followed in a study of the collection is shown by the numbering of the cases. Thus, entering Hall 63 from the south, the visitor finds case No. 1 at his or her left, and the order then follows along the west wall through the oxides in Case 4, back on the western side of the center aisle, down the eastern side, and back along the east wall; then passing to Hall 64, the order continues with the phosphates in Case 15 on the western side and ends with Case 17 on the eastern side.

The large headings above each case indicate the groups to which the specimens beneath belong, and in each division corresponding to these are tables showing the chemical composition and system of crystallization of these minerals. The individual specimen labels show the name of the species and the locality.*

Cases 1A, 3A, 4, 6B, 8A, 10B, 15, 16.—As specimens worthy of especial interest may be mentioned among the sulphides, Case 1A, the large crystals of stibnite from Japan; among the haloids, Case 3A, the beautiful green and purple fluorites from English and American localities; among the oxides, Case 4, the extensive collection of natural and artificially colored agates from South America; among the carbonates, Case 6B, the curiously distorted calcite crystals, sometimes called "butterfly twins," from Egremont, England, and the brilliant groups of the same mineral from the Big Rig Mine, Cumberland, England; Case 7A, the Flos Ferri aragonites, which look like triumphs of the confectioners' art, and the delicately tinged stalac-

*Owing to the lighting of the hall from above, a good observation of the specimens is somewhat hindered by the reflection from the cases. In order to avoid this the observer is advised to view the specimens from the side rather than from the front.



PLAN OF HALL 64.

tites of the same mineral from the Copper Queen Mine, Arizona; among the silicates, Case 8A, the large crystals of Amazon stone from Pike's Peak, Colorado, and, Case 10B, the transparent and perfect crystals of topaz from Siberia; among the phosphates, Case 15, the richly colored vanadinites from Arizona, and among the sulphates, Case 16, the brilliant groups of celestite from Sicily.

Case 13.—A collection of natural and polished specimens of agatized wood from Arizona.

Case 14.—A large display of the beautiful rubellite in lepidolite from San Diego County, California, and some massive gypsum crystals from the cave in Wayne County, Utah, which was recently opened by Prof. J. E. Talmage, of Salt Lake City. These crystals are of remarkable size, some being nearly four feet in length, and are nearly transparent.

Case 17A.—Following the end of the systematic collection in Room 64 is a small collection of pseudomorphs, which illustrates the way in which one mineral may imitate or replace another.

Cases 17B and C.—A series illustrating the physical properties of minerals, such as form, structure, diaphaneity, lustre, hardness, and specific gravity.

Cases 17D, E, and F.—A series of crystal models, representing the typical forms and position of the axes in the six systems of crystallization. Together with these are a number of models of crystals of the more common mineral species, and some of the crystals themselves. The models are mounted in their true crystallographic position, and are intended to illustrate not only the proper position, but also the distinctive crystal forms which characterize the common minerals.

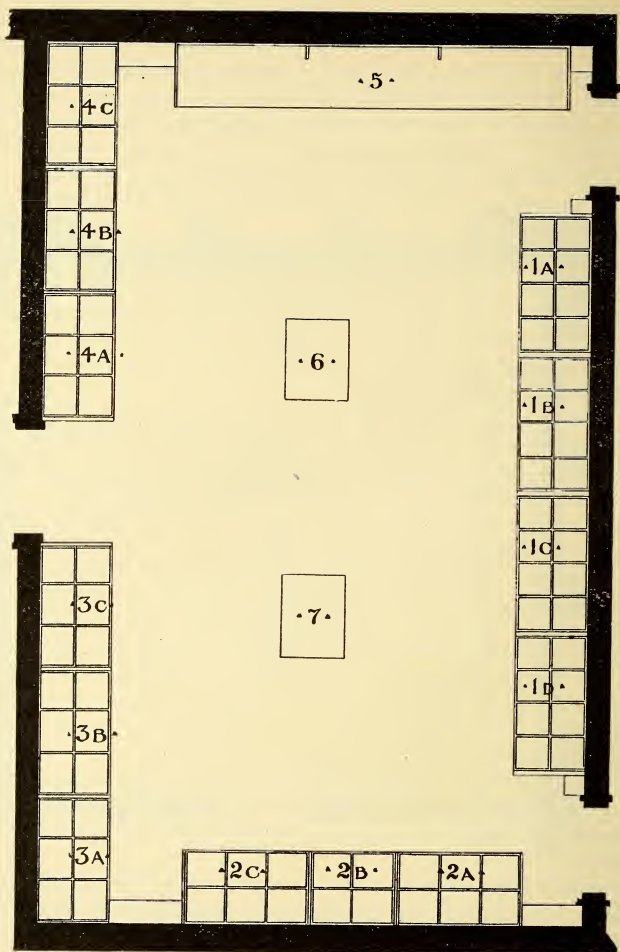
Case 17G.—A series of models of famous gold nuggets.

Cases 18 and 19.—Gem minerals, showing in the native state the minerals which are the source of gems and ornamental stones.

Case 20.—A small collection of the cut stones is contained in this case. Others may be seen in the Department of Industrial Arts.

Case 21.—Slab of lapis lazuli from Peru, said to be the largest single block ever quarried.

Case 22.—Group of amethyst crystals from Thunder Bay, Lake Superior.



PLAN OF HALL 65.



HALL 65.

STRUCTURAL AND DYNAMICAL GEOLOGY.

Case 1A.—Dendrites.

Case 1B.—Volcanic products, illustrated by lavas, volcanic bombs, etc.

Case 1C.—Cave products, represented by stalactites and stalagmites. (See foot note, p. 47.)

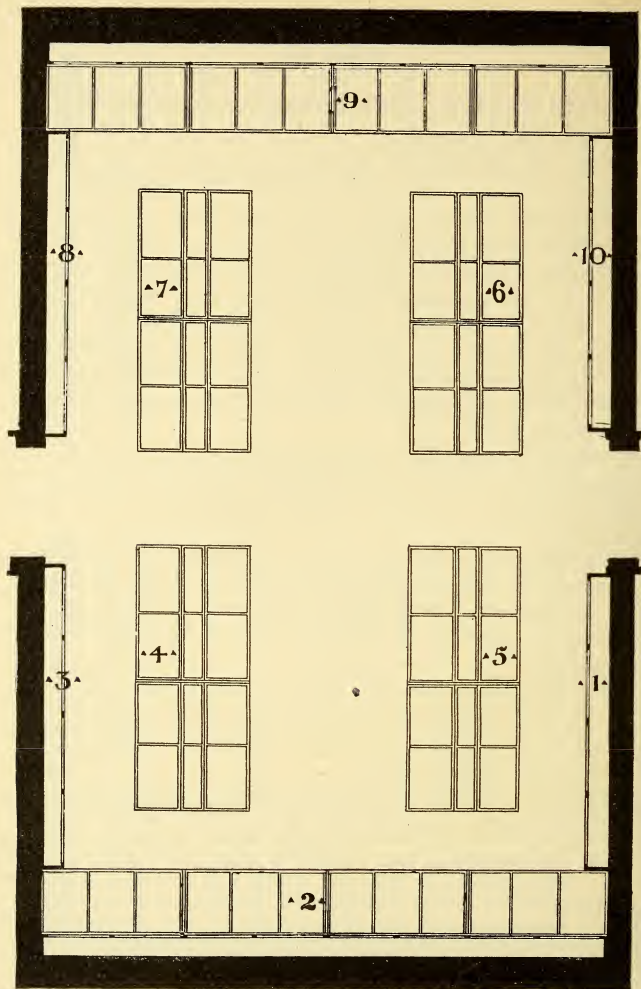
Cases 2 and 3.—Specimens representing varieties of rock structure. The specimen labels here show; first, the kind of structure; second, the name of the object; third, the locality. Among the specimens representing concretionary structure, the clay concretions are worthy of note, since they assume curious forms which are often mistaken by unscientific observers for fossil turtles, eggs, or fruits.

Cases 2C and 3.—Septaria, geodes, specimens illustrating nodular, öolitic, pisolitic, and spherulitic—which are really varieties of concretionary—structure, cellular, porphyritic, and stratified structure.

The septaria are produced from concretions by drying and subsequent filling of the cracks with calcareous matter. The resemblance of these to a turtle shell is often very striking, and their handsome appearance when cut and polished is shown by several specimens.

Case 4.—Specimens illustrating rock texture; veins; the effects of erosion by water, sands, and other agencies; ripple-marks, which are the preservation in stone of lines once made by ripples on a mud-flat; striation and polishing produced by glacial action; faulting; and metamorphism.

Case 5.—Various large specimens of types already mentioned, including a large septarium from Perry, New York; a large slab showing mud cracks from Holyoke, Mass.; two slabs showing fluting and polishing due to glacial action, from Kelly Island, Ohio. In the middle of the room will be found a large slab showing ripple marks, and a collection of basaltic columns from the Giant's Causeway and the Rhine Valley. The grouping of the latter is intended to illustrate the stair-like arrangement which is usually seen in basaltic cliffs that have been exposed to erosion. Further description and explanation of any of the types of structure represented may be obtained from Geikie's Text Book of Geology, Dana's Manual of Geology, or Le Conte's Elements of Geology, to be found in the Museum Library.



PLAN OF HALL 66.



HALL 66.

LITHOLOGY.

This section includes two collections: one of rock specimens systematically arranged, and one of polished and ornamental stones. The former includes about 1,800 specimens of uniform size, 4x3x1 inches, representing the different kinds of rocks. The latter is made up of about 200 specimens of polished slabs of different sizes, and is intended to illustrate the different ornamental stones, chiefly marbles and granites. It may, however, be considered a part of the systematic collection, the polished slabs having been placed as near as possible to the corresponding specimens in the former, so that the two may be studied as one if desired. They will be so described here. As in other sections of this department, the numbering of the cases indicates the order of the arrangement. The series begins at the left of the eastern entrance to Hall 65.

The rock specimens are classified under three heads: Eruptive, Sedimentary, and Metamorphic. The Eruptive rocks are those which have been formed at great depths, and were once in a state of igneous fusion. Being most deeply seated they may be considered to be the primary rocks of the earth's crust, so far as it is known. From these, aqueous agencies form the Sedimentary rocks by erosion and deposit, or by chemical precipitation. The latter in turn may be changed to Metamorphic rocks by dynamical and chemical agencies, which, however, do not usually destroy the lines of stratification.

Cases 1, 2, 3, 4, and part of 5.—Eruptive rocks. The classification which has been adopted for these is based upon the following plan:

First, an arrangement according to percentages of silica; the highest in silica, or acidic rocks, being placed at the beginning of the series, then those having lower percentages, down to the lowest, or basic rocks.

Under the divisions representing different percentages of silica are placed, first, the coarse grained, or holocrystalline rocks, then those of finer grain or having a porphyritic structure (porphy-

ries, etc.), down to the amorphous rocks. Thus, beginning with the granites, which have from 80 to 65 per cent. of silica, we pass among the coarse grained rocks to the diorites, which have between 65 and 55 per cent., then to the gabbros and diabases, having usually more than 45 per cent., and end with the peridotites, having below 45 per cent. A corresponding series begins with the syenites, and ends with the nepheline rocks.

Cases 1, and part of 2.—First row, *granite* and its varieties, such as *granitite*, *graphic granite*, etc. These are rocks having quartz, alkaline feldspar, and one or more minerals of the mica, amphibole, or pyroxene groups as essential constituents.

Second row, *granite-porphry*, *quartz-porphry*, *vitrophyre*, *felsophyer*, etc. Like the preceding in composition, but more or less porphyretically developed.

Third row, *rhyolite*, *nevadite*, *pumice*, *obsidian*, etc. These are amorphous volcanic rocks, having high percentages of silica, usually more than 70 per cent.

Upper Part of Cases 2 and 3.—Polished slabs, chiefly *granite*, with some *marbles*.

Remainder of Case 2, and Case 3.—*Syenite-nephelinite* series.

FIRST GROUP.—First row. *Syenite*, *minette*, etc. Holocrystalline rocks, having orthoclase and biotite as essential constituents.

Second row. *Trachytes*. Tertiary eruptive rocks, characterized by the predominance of an alkaline feldspar, usually sanidine, and freedom from quartz. An iron bearing mineral is also usually present.

SECOND GROUP.—First row. *Nepheline* or *elaeolite syenites*, rocks comprised of nepheline, orthoclase, and usually a pyroxenic mineral and plagioclase feldspar.

Second row. *Phonolites*, rocks consisting of an alkaline feldspar, with minerals of the nepheline and leucite groups, and usually a monoclinic augite.

THIRD GROUP.—*Tephrites* and *basanites*, rocks having nepheline or leucite and lime-soda feldspar, as essential constituents. They are usually porphyritic in structure, with a more or less amorphous ground mass.

FOURTH GROUP.—*Kersantite*, *leucite basalt*, *leucitite*, *nepheline basalt*, and *nephelinite*. Rocks containing leucite or nepheline in place of feldspar, and these usually associated with augite.

Case 4 and part of Case 5.—FIRST GROUP, *diorite* and *varieties*—holocrystalline rocks, having plagioclase feldspar and hornblende or black mica as essential constituents.

Second row, *andesites* and *dacites*, amorphous or porphyritic rocks, composed of soda lime feldspar, black mica, hornblende, and in the case of the *dacites*, quartz.

Third row. *Porphyrites* of various kinds.

SECOND GROUP.—First row, *gabbros* and *norites*. Rocks consisting of a basic soda lime feldspar, with diallage, or other pyroxene.

Second row, *diabases*, rocks having plagioclase feldspar and augite as essential constituents.

Third row, *basalts*, *dolerites* and *melaphyres*. The former are common rocks widely distributed in the form of dikes and intrusive sheets. They are popularly known as trap rocks. Their composition is like that of the preceding.

THIRD GROUP.—First row, *pyroxene rocks*, *diallagite*, etc. Basic rocks, composed largely of pyroxene.

Second row, *peridotite* and varieties, including *therzolite*, *picrite*, and *dunite*. These are highly basic rocks, composed chiefly of olivine, but having chromite and other iron oxides usually present.

Remainder of Case 5, Cases 6 and 7.—Sedimentary rocks. Rocks formed as chemical precipitates are placed first. These include *hematite*, *limonite*, *calcareous tufa*, *oölitic* and *pisolitic limestones*, *onyx*, several polished slabs of which are shown, *serpentine* and its varieties, also illustrated by many polished slabs, *talc* or *steatite* including *verd-antique marble* and *ophite*, *gypsum*, *alabaster*, etc.

Then follow rocks formed as sedimentary deposits, and fragmental in structure. The principal varieties of these are arranged in this order: *sandstone*, *conglomerate*, *breccia*, *quartzite*, *shale*, *clays*, *tufas* or *tuffs*, *coquina*, *chalk* and *limestones*.

Cases 8, 9 and 10.—Metamorphic rocks.

These are divided into the stratified or bedded, and foliated or schistose.

The first class includes the *crystalline limestones*, *marbles*, and *dolomites*. These are made up chiefly of the mineral calcite, and are formed from remains of mollusks, corals, and other ani-

mals which first produced limestone, and this was changed by the action of heat to the crystalline condition. In some cases the original fossils remain intact, as is illustrated in many of the polished slabs.

Upper part of Case 9.—A large and complete collection of varieties of *marble*, the different colorings being produced largely by iron oxides, micaceous minerals, or finely distributed sediment.

Lower part of Case 9 and Case 10.—Following the *marbles* are placed the *crystalline schists*, which are rocks of variable composition, but characterized by a pronounced schistose structure, especially where mica is the prevailing constituent. Here are included *argillite*, *clay-slates*, *eclogite*, *quartzite*, *phyllite*, *paragonite schist*, *chlorite schist*, *mica schist*, and others.

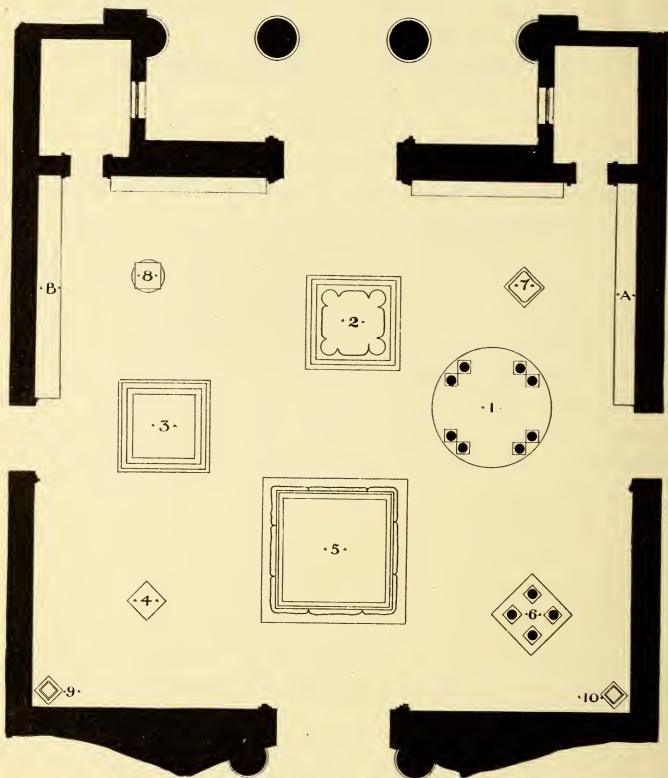
Last in the series appear the *gneisses*, a class of rocks essentially like the granites in composition, but differing from them in structure, in that the constituents are arranged in approximately parallel bands or layers. These are the oldest of crystalline rocks, and considered by many to represent portions of the primeval crust. Others, however, regard granites as the last term in the metamorphism of such rocks, and for that reason the gneisses have been placed in juxtaposition to them. *Varieties* of *gneiss*, based upon the prevailing mineral, whether *biotite*, *muscovite*, *hornblende*, or others, are included here.

DIVISION OF ECONOMIC GEOLOGY.

The collections in this Division are systematically arranged to show how the metallic and non-metallic elements of economic importance occur in nature, as minerals and ores, and to illustrate some of the processes used in the extraction, treatment, and application of certain metals. They are for the most part made up of the collections transferred to the Museum by the Chief of the Department of Mines and Mining of the Exposition.

This Division also contains, besides numerous metallurgical products—Hall 76 is entirely devoted to iron products,—a great variety of coal, petroleum, asphaltum, and combustible derivatives and products; rock sections, and borings from petroleum wells, cement, gypsum, salts, ochres, artificial fuels, and other material. Each room contains one or more groups, and each group is supposed to show the typical minerals and ores of the metal, or element after which the group is named. The element of predominating value gives its name to the group. Frequently the metal, or element, is present in only very minute quantities, and not to be seen by the naked eye, or even with the aid of an ordinary magnifying glass; as, for instance, in nearly all of the gold ores.

The halls occupied by this Division are Nos. 67 to 80 inclusive, except Hall 76, Section of Metal-Working Industries.



PLAN OF HALL 67.



HALLS 67 AND 68.

QUARRY PRODUCTS.

The exhibits in Hall 67 represent various marbles and sandstones obtained from exhibits at the Exposition.

No. 1.—Column of sandstone pillars capped with grindstones. There is placed in the openings, currier's block, pocket cutlery, and edged tool grindstones, all from northern Ohio from the strata of the Carboniferous age.

No. 2.—Fountain of Italian marble from Genoa, Italy; 300 years old; made by Count Fratenello.

No. 3.—A pyramid of various marbles from Greece.

No. 4.—An anvil, hammer, and cog-wheel chiseled from Bedford, (Ind.) sandstone.

No. 5.—Four mantel pieces surround an obelisk made of a variety of marble from Norway.

No. 6.—Eight Costa Rica vases, cut from porphyry and sandstone.

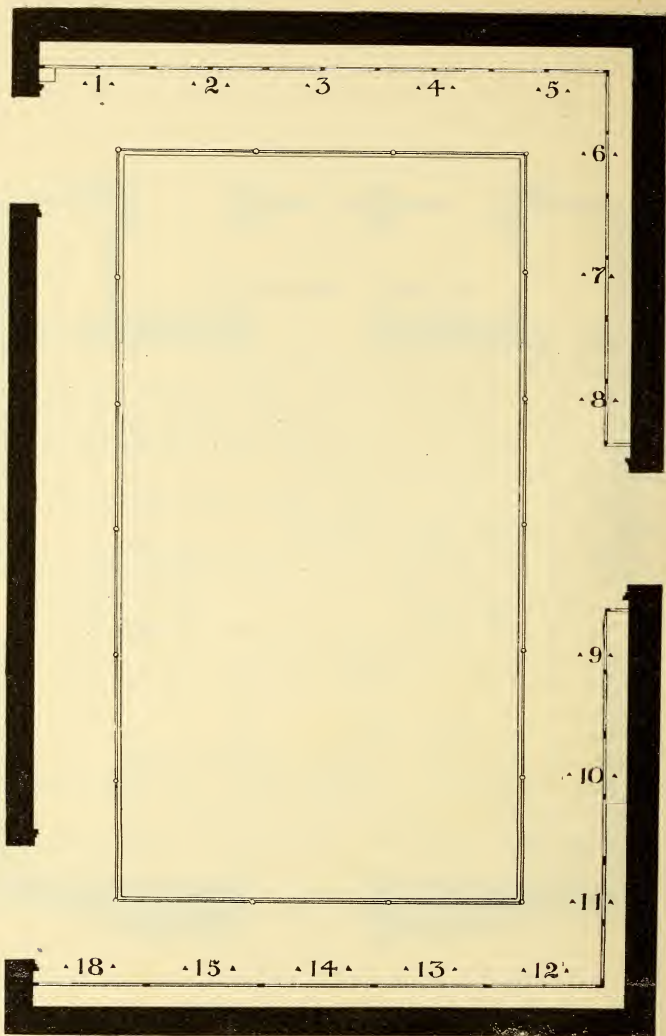
No. 7.—Sandstone, Indiana.

No. 8.—Lava Stone, Colorado; Sandstone, Ohio.

Nos. 9 and 10.—Sandstone Column, New South Wales, capped with vases of sandstone from Costa Rica.

Platforms A and B.—Various granite and sandstone columns. Blocks of polished marble—Greece.

Hall 68 contains a representative collection of stone specimens from the different stone quarries of the United States.



PLAN OF HALL 69.



HALLS 69, 70, AND 71.

CARBONS, MINERAL COALS, SOLID AND
LIQUID BITUMENS.

At the head of the carbon group are placed the diamond, a crystallized form of carbon in its purest state, and the hardest substance known; and graphite, also a crystallized form of carbon, one of the softest minerals, containing generally a small amount of impurity. Then follow in order the other carbon minerals.

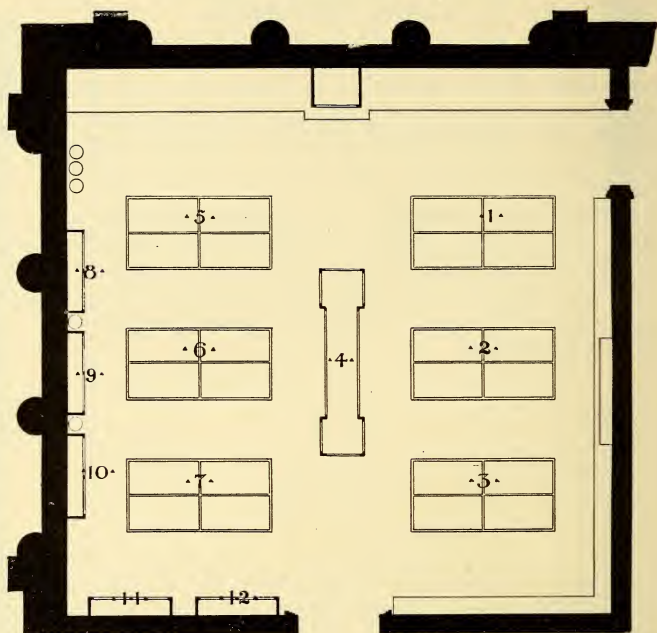
The Coals : Anthracite, Semi-anthracite, Semi-Bituminous, Bituminous, Lignite. *Bitumens* : Solid Bitumen, Liquid Bitumen.

Some of the leading fossils of the coal measures are shown in connection with the coals, although a far greater variety of larger and more perfect specimens may be seen in the Division of Systematic Geology.

HALL 69.

The plate-glass map of the United States, on the floor, shows the distribution and extent of the great coal fields. The scale of the map is ten miles to one inch. Samples of coal from these different coal areas, representing the chief coal deposits of the United States, are to be found arranged under their respective states in the wall cases as follows :

Case 1—Virginia ; **2**, Maryland ; **3**, Pennsylvania ; **4**, West Virginia ; **5**, Ohio, Georgia ; **6**, Tennessee, Alabama ; **7**, Indiana, Kentucky ; **8**, Illinois ; **9**, Iowa, Missouri ; **10**, Iowa, Missouri ; **11**, Texas, Indian Ter. ; **12**, Kansas, N. Dakota ; **13**, Colorado, New Mexico ; **14**, Utah, Wyoming ; **15**, Oregon, Montana ; **16**, California, Washington.



PLAN OF HALL 70.



HALL 70.

Case 1A.—A single diamond from Kimberly, South Africa. Other specimens can be seen in the gem series of the section of Mineralogy. "Blue Ground" (matrix) of the diamond from De Beers mines, Cape Colony, South Africa.

Case 1B.—Graphite and manufactured articles in which graphite is an important constituent.

Case 2A.—Anthracite coal.

Case 2B.—Semi-anthracite coal; Semi-bituminous coal; Bituminous coal.

Case 3A.—Cannel coal; Bituminous coal.

Case 3B.—Lignite; Woody Fibre; Peat.

Case 4.—Crude and Refined Petroleum.

Case 4A.—Coke—48 and 72 hours.

Case 4B.—Eggette and block coal, manufactured from slack.

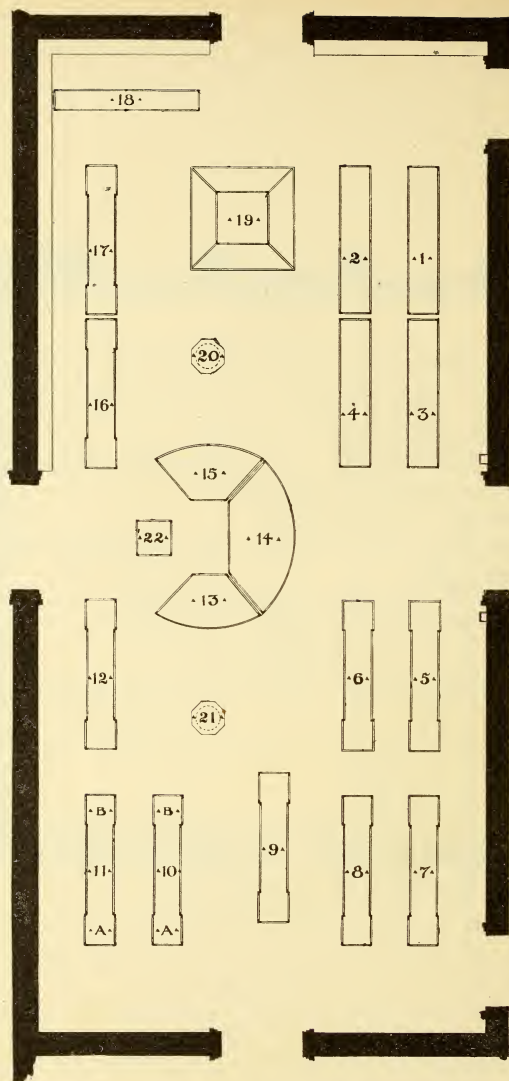
Case 5A.—American, German and French manufactured pressed coal; Coal shales.

Case 5B.—Coke.

Case 6A.—Liquid Bituminous coal; Petroleum shale.

Case 6B.—Asphaltum minerals.

Case 7.—Application of Asphaltum.



PLAN OF HALL 71.



HALL 71.

LIQUID BITUMEN AND ITS DERIVATIVES.

This hall contains a collection of crude oil from the chief oil regions in the United States, and of the products obtained from these oils by destructive distillation, as exhibited by the Standard Oil Company in the Mines Building. A series of borings are also exhibited here, showing certain sections of the geological strata through which some of the highly productive oil wells have been sunk.

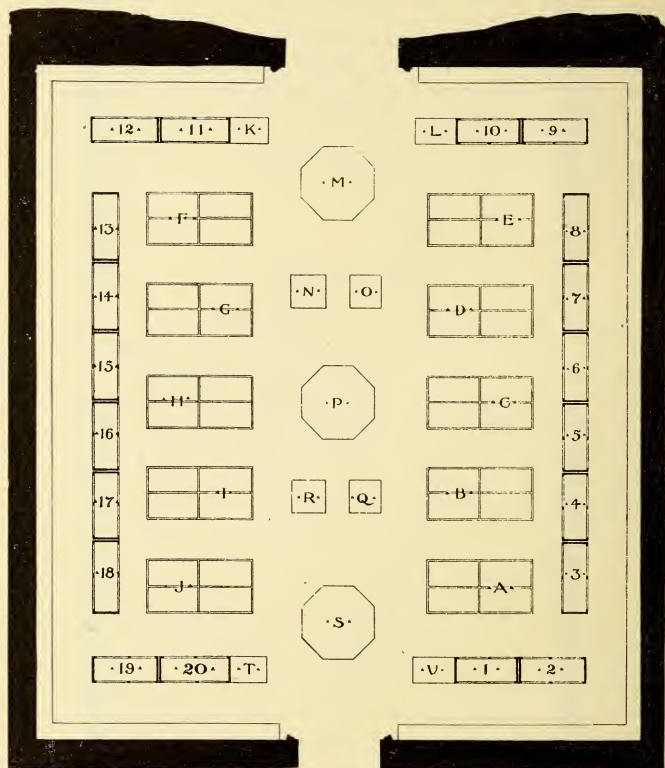
PETROLEUM.

Cases 1, 2, 3, and 4.—Crude petroleum, varying considerably in color from black through different shades of dark green, brown to amber, the greenish brown being the most common. It is of unpleasant odor in the crude state, and of different grades of consistency, from the thin liquid to the thick and viscous. It is generally liquid, but exposed it becomes more or less oxidized and hardens. As to the chemical nature of petroleum, the members of the paraffine series enter largely into its composition. They vary from the simple marsh gas through a series of liquids to solid forms. The theory generally accepted as to the origin of petroleum is that it has resulted from the decomposition of animal and vegetable matter. It occurs in the rocks or deposits of nearly all geological ages. It is associated most abundantly with sands, sandstones, and clayey shales, but it is found also permeating limestones, giving them a bituminous odor and rendering them sometimes a continuous source of oil. Specimens of these shales, sands, and limestones are to be seen in the collection.

Case 5.—Twenty-eight specimens of standard white illuminating oil—standard required by state laws—representing various state tests.

Case 6.—Twenty-eight specimens of water-white refined oil as required by state test.

Case 7.—Forty-eight specimens of cylinder oil of various grades.



PLAN OF HALL 72.

Case 8.—Lubricating oils of special grades.

Case 9.—General lubricating oils.

Cases 10 and 11.—Paraffine, vaseline, and other commercial products—all having an extended and various use. These products are obtained by different distillations, including destructive distillation, and by chemical and other methods of treating the resulting distillates.

Case 12.—Special grades of illuminating oils.

Case 13.—Naphtha derivatives from crude oil.

Case 14.—Burning oils obtained from crude oil.

Case 15.—Residuum and its derivatives.

Case 16.—High test illuminating oils.

Case 17.—The use of petroleum products in the arts.

Case 18.—The minerals of the oil strata.

Case 19.—A model of a modern oil refinery, and, above, a model of the original refinery—the one built at Cleveland, Ohio, in 1863.

Cases 20 and 21.—Specimens of sands, limestones, and shales from the various oil strata.

Case 22.—Represents one barrel (42 gallons) of petroleum. About this amount is delivered every second by the pipe lines of the Standard Oil Company.

HALL 72.

PLATINUM, GOLD, SILVER, AND LEAD.

The collections in this Hall comprise the typical platinum, gold, silver, and lead ores, and the minerals of economic value that commonly enter into the composition of these ores. There are also to be seen here products resulting from the milling and metallurgical treatment of the ores.

PLATINUM.

Case A.—Platinum is usually found in pebble and small grains associated with iridium, osmium, palladium, gold, copper, and chromite, and was first found in the alluvial deposits of the river Pinte, in the district of Choco, near Popayan, in the U. S. of

Colombia, S. A., where it received its name, *platina*, from plata, silver white. It has a metallic luster and is infusible.

The collection of Platinum contains examples of native platinum from over twenty localities, in form of nuggets and grains; a series of rocks and platiniferous soil, and the concentrates after the first, second, and third washing, as collected at the Demidoff Platinum Mines, Nizhni Tagilisk, Ural Mountains, by Geo. F. Kunz; coins struck in platinum and gilded passed for gold in Portugal and Spain during the past century; bogus gold dust platinum grains plated with gold.

GOLD.

Cases 1, 2, 3, 4, and 5.—This element is generally found in the metallic state nearly always alloyed with more or less silver, and sometimes with other metals. In certain localities it occurs beautifully crystallized as wire gold and leaf gold. Iron and copper pyrites are often mistaken for gold, owing to the resemblance in color; but gold is a soft, ductile, and malleable metal, whereas the other minerals are very much harder and brittle. Comparatively a small amount of gold is obtained from tellurium ores, in which it occurs chemically combined with the element tellurium, the only element with which gold is known to exist chemically united in nature. The tellurium minerals are quite rare.

Case B.—Collection of nearly all the known alloys of gold and silver with copper, tin, zinc, lead, arsenic, and other metals, and a collection of wash-water, concentrates from an exhaust blower that collects the dust from the air; also old shoes, and the flooring of the gold and silver shops, and savings therefrom; also buttons of gold and silver obtained from equal quantities of the above mentioned articles, illustrating the methods of saving gold and silver, as practiced by Messrs. Tiffany & Co., of New York.

Case C.—Gold ores.

Case D.—Gold-silver ores.

In the center of hall, arranged in two cases, is a collection of gold nuggets from Kittitas County, Washington, with views of California placer mining, showing method used in 1849, and the present system of hydraulic mining, which consists in the disintegration of the auriferous alluvia, by propelling a heavy jet of water under pressure upon the bank, and in washing off the gravel in sluices in which is distributed mercury. The gold forms an amalgam and remains caught.

SILVER.

Cases 6, 7, 8, 9, and 10.—Silver ores.

Silver occurs in nature in its native state, often beautifully crystallized in a variety of forms, of which one of the most common is dendritic—tree-like. The common silver minerals are argentite, stephenite, pyrargyrite, proustite, cerargyrite. Tetrahedrite (gray copper), properly considered a copper mineral, may be included in the list, as a percentage of its copper is frequently replaced by silver. The gangue in which the ores occur is made up of a great variety of minerals, quartz predominating as a rule. Lead minerals are usually found with those containing silver.

Case E.—Silver ores.

SILVER-LEAD ORES.

Cases 11, 12, 13, and 14.

These ores contain the lead minerals associated with one or more of the silver minerals. Argentiferous (silver-bearing) galena is the most common lead mineral entering into the composition of silver-lead ores.

Cases F and G.—Metallurgical products resulting from the treatment of gold, silver, and lead ores.

Case H.—The Roessler-Edelmann desilverizing process. Samples of materials and products.

LEAD ORES.

Cases 15, 16, 17, 18, 19, and 20.

Galena—sulphide of lead—of all the lead minerals is most abundant and constitutes the fundamental lead ore. When pure it contains 86.6 per cent. lead. Galena without exception contains more or less silver, and where the amount of silver is present to make its extraction profitable, it is called argentiferous (silver-bearing galena). Handsome large crystals are found where Galena occurs in a comparatively pure state. The crystals have cubical cleavage, and their faces, when unpolished, as well as the cleavage surface have a bright metallic luster.

Cerussite—carbonate of lead—containing 77 per cent. of lead, usually white when pure, and Anglesite (lead sulphate) containing about 68 per cent., also of a white color when pure, are the next most important lead minerals.

This metal is used for lining sulphuric acid chambers, pipes for conveying water and gas, and the manufacture of alloys, lead paints, etc.

Case I.—Lead ores.

Case J.—Alloys of lead with other metals.

SPECIAL FEATURES.

Exhibits in the center of the hall :

Object K.—Block of ore from 40 ft. level of the Mitchell, New South Wales. 36 tons yielding 3,406 oz. silver, and gold at the rate of \$15 per ton.

Object L.—Auriferous Pyrite, Park County, Colo. Assays \$45 gold per ton.

Object M.—Silver and gold ore from the State of Washington, and other specimens from American localities.

Object N.—Auriferous quartz. San Miguel County, Colorado. Assays average \$6 to \$8 gold per ton.

Object O.—Copper-silver ore. Ouray County, Colorado. Assays copper, 28 per cent.; silver, 42 oz. per ton.

Object P.—Silver-lead ores. Barrier Range, New South

Wales, Australia. Assays silver, 58 oz. per ton; lead, 72 per cent.

Object Q.—Copper-silver ore. Leadville, Colorado. Assays silver, 41 oz. per ton; copper, 18 per cent.

Object R.—Zinc-lead ore. Laurium, Greece.

Object S.—Gold and silver ore from the State of Washington, and other specimens from American localities. Silver, lead, and copper ore from the Cordillera Hill, Silver Mine, Peelwood, New South Wales, Australia.

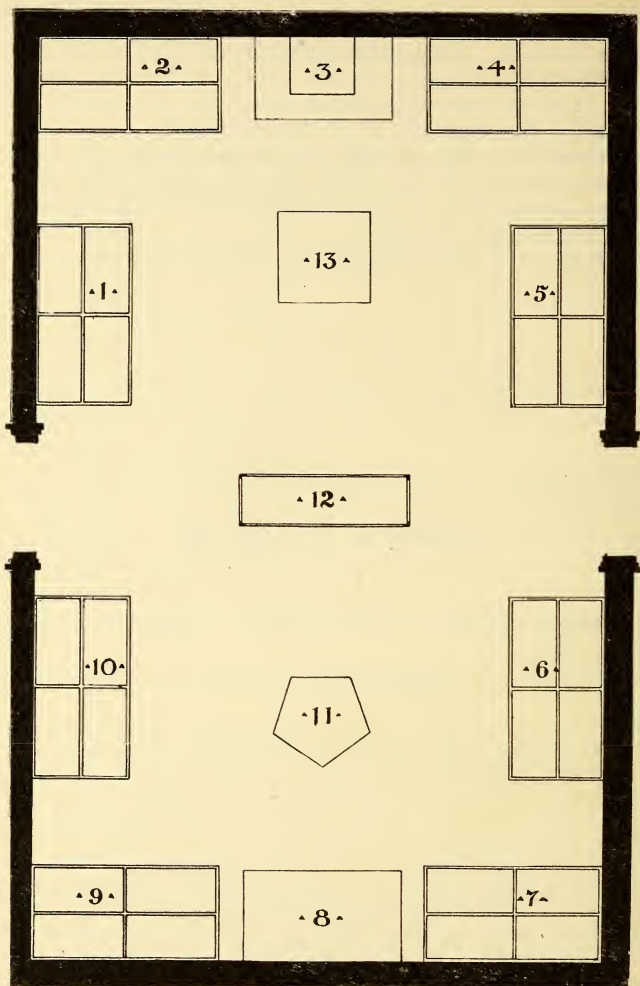
Object U.—Gold and silver ore. British Columbia.

HALLS 73, 74, AND 75.

Hall 73.—Offices of the Divisions of Systematic and Economic Geology.

Hall 74.—Reference Library for Systematic and Economic Geology.

Hall 75.—Assay Office and Laboratory.



PLAN OF HALL 77



HALL 77.

FICTILE MATERIALS, ETC.

Cases 1, 5, and 12.—Clays are the product of the decomposition of rocks containing feldspar ; for instance, granite and porphyry. Kaolin is one of the purest of the clays and is non-plastic when washed.

The uses of clay making materials are generally as follows :

1. *Domestic*—Utensils, porcelain ware, and earthen ware.
2. *Structural*—Brick, common front or pressed, ornamental, hollow, glazed, terra cotta, roofing tile, drain tile, flooring tile, fire-place tile, chimney flues, chimney pots.
3. *Hydraulic Structures*—Water conduits, reservoir linings, sewer pipe.
4. *Industrial Arts*—China clay, chemists' crucibles, and other apparatus, wall and writing paper filling, refractory clay, lime and cement.
5. *Ornamental and Æsthetic uses*—Tile, ornamental pottery, terra cotta decorations, artists' moulding clay.
6. *Imitative*—Food adulterant ; paint adulterant.

ALUMINIUM.

Case 10.—The minerals from which aluminium is obtained are Bauxite, found abundantly in Georgia, and Cryolite in Greenland. By chemical treatment of the minerals, and subsequent electric smelting of oxide of alumina the metal is liberated. Aluminium forms alloys with gold, copper, steel, and other metals, some of the alloys possessing very useful properties.

Cases 2 and 4.—Assayer's crucibles, muffles, etc.

No. 3.—Pottery.

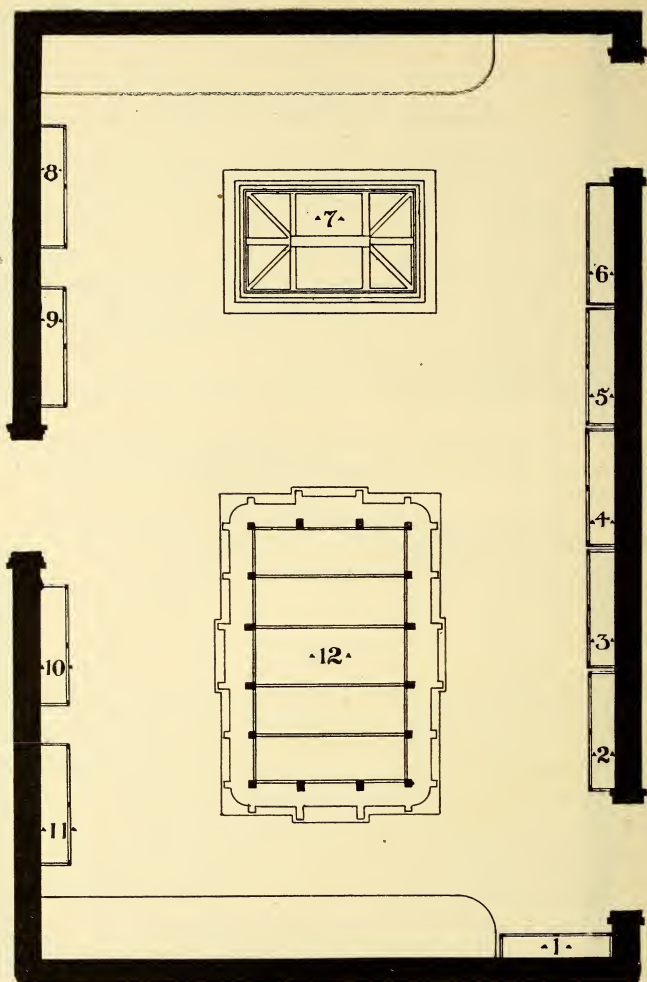
Case 6.—Fancy brick.

Cases 7 and 9.—Tripolite and its application.

No. 8.—A giant muffle and exhibit of sewer pipe.

No. 11.—Cement materials, made mainly of Portland cement.

No. 13.—Terra cotta materials.



PLAN OF HALL 78.



HALL 78.

NON-METALLIC MINERALS USED IN CHEMICAL MANUFACTURE, AND FOR OTHER PURPOSES.

Some of the substances included under this group have a direct use, such as sulphur, salt, nitre, glauber salt, and alum. Again these and others are used for chemical purposes, as salt in the manufacture of chlorine; fluor-spar as a flux in metallurgical operations; pyrites and nitre in the manufacture of sulphuric acid.

Cases 1 and 2.—Different grades of domestic and English salt.

Case 3.—Gypsum for the manufacture of plaster of Paris.

Cases 4 and 5.—Sulphur, crude and refined.

Case 6.—Asbestos and associated rocks.

Case 7.—Complete collection of various forms of asbestos and its application.

Case 8.—Mica and its commercial uses.

Case 9.—Magnesite; natural carbonate of magnesia from California.

Case 10.—Various natural and prepared salts.

Case 11.—American salts.

Case 12.—A miscellaneous collection:—phosphates from Florida; sulphur from Greece; natural and prepared salts from Germany. A large and particularly fine cube of rock salt from Russia deserves attention.

Platforms:—Large specimens of salt, gypsum, apatite—phosphate of calcium—fluorite, and iron pyrite.

HALL 79.**COPPER, ZINC, ANTIMONY, NICKEL, IRON
AND MANGANESE.**

The collections in this hall comprise the typical copper, zinc, antimony, mercury, nickel, iron, and manganese ores, and the minerals of economic value that commonly enter into the composition of these ores. There are also to be seen here products resulting from the treatment of some of the ores.

COPPER.**Cases 1, 2, 3, 4, 5, and A.—Copper ores.**

Copper is found in a metallic state in large quantities, and very pure. The chief sources of supply of this metal are (1), the sulphide ores; (2), the native metal; (3), the oxides and carbonates.

Chalcopyrite—copper iron sulphide—containing about 34 per cent. of copper.

Bornite—sulphide of iron and copper—carrying between 55 and 60 per cent. of copper.

Chalcocite—sulphide of copper—containing 80 per cent. of copper.

Malachite—carbonate of copper—a light green carbonate carrying about 57 per cent., and Azurite—the blue carbonate—having about 55 per cent. of metal.

Tenorite—black oxide of copper—carries 80 per cent. of metal.

Cuprite—red oxide—when pure, contains 88 per cent. of copper.

Chrysocolla—bright bluish-green silicate of copper—containing, when pure, about 36 per cent. of copper.

Tetrahedrite—gray copper—a complex mineral of sulphide of copper and antimony, frequently containing other metals, notably silver.

Copper is used largely in the arts and manufactures as wire, sheet copper, and in the production of alloys, and for numerous other purposes.

Case 6.—Represent the ores and rocks of a copper mine, Bisbee, Arizona.

Cases B, C, and D.—Metallurgy of copper and the applications of the metal.

ZINC.

Cases E, F, 6, 7, 8, 9, and 10.—Zinc ores.

Sphalerite, or blende, is the most common of all the zinc minerals, containing 67 per cent. of zinc. It occurs massive and handsomely crystallized in a variety of colors. The crystals have a resinous lustre and easy cleavage. Other zinc ores shown are: Smithsonite (carbonate of zinc); Calamine (silicate of zinc), or a combination of these minerals.

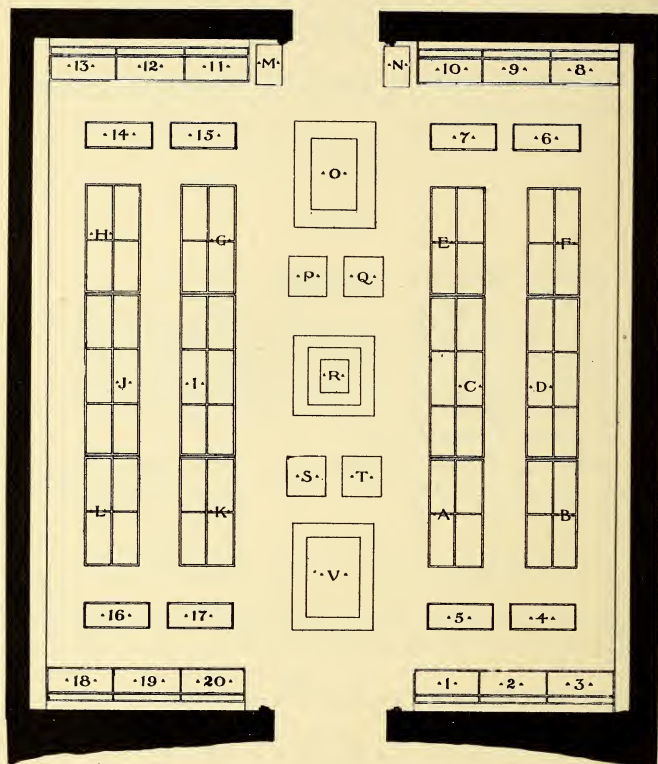
Zinc does not occur in the metallic state in nature. It is found chemically combined with one or more elements in the different zinc minerals.

The lead regions of Illinois, Missouri, and Kansas are heavy producers of zinc ore. Zinc is used extensively in the arts and manufactures; as sheet zinc for galvanic batteries and coating wire, in the production of alloys, zinc paint, and for other purposes.

TIN.

Cases 11, 12, and 13.—Tin ores,—Cassiterite and Stream Tin.

The only ore that seems to be relied upon as a source of tin is cassiterite, an oxide which contains about 78 per cent. When found in placer deposits it is called stream tin. It is found in



PLAN OF HALL 79.

many foreign countries, and to some extent in the United States. Tin is used in alloys, casts, and in coating iron, lead, and other metals, and for numerous purposes in the arts.

ANTIMONY.

Case 14.—Stibnite (sulphide of antimony), is the universal antimony ore. Its composition, when pure, is antimony 71.8 per cent., sulphur 28.2 per cent. The metal enters into a number of very valuable alloys as metal, pewter, britannia, babbitt metal, and is used in medicine.

MERCURY.

Case 15.—Mercury Ores.

Mercury—quick-silver—is found native, but obtained almost altogether from the mineral Cinnabar, containing, when pure, 87 per cent. of metal.

California is one of the heaviest producers of mercury. The most extensive uses to which mercury is put are in the extraction of gold and silver, and in the preparation of vermilion. It is also used in the manufacture of mirrors, and in medicine, etc.

NICKEL.

Cases G and H.—Nickel Ores.

Nickel, which is commonly associated with cobalt, is derived from ores containing the nickel minerals: Millerite (sulphide of nickel), Siegerite (sulphide of nickel and cobalt), Niccolite (copper colored arsenide and silicates of an apple green color).

The ore from which the largest specimens have always been obtained is magnetic iron pyrite. Nickel occurs in the United

States, Canada, New Caledonia, and other localities, and is used extensively in the manufacture of alloys for electroplating and coinage.

IRON.

Cases I, J, K, L, 16, and 17.—Iron Ores.

The richest iron ore minerals are: Magnetite (black oxide of iron), containing, when pure, a little more than 72 per cent. metallic iron; Hematite (red oxide of iron), containing 70 per cent. of iron; Limonite (brown oxide of iron), containing 60 per cent. of iron; and Siderite (carbonate of iron) which contains about 48 per cent. of iron.

MANGANESE.

Cases 18 and 19.—Manganese Ores.

The manganese mineral most extensively used in the arts is Pyrolusite (black dioxide of manganese). Manganese ores are found in many localities. The very important iron alloy Spiegeleisen (ferro manganese), is obtained by the smelting of iron ore containing manganese.

Manganese ores are employed in the arts for the liberation of chlorine, manufacture of bleaching powder, and in glazing and staining pottery.

SPECIAL FEATURES.

Large pieces in the center of the Hall:

Object M. Gossan (iron ore), from Virginia.

Object N. Limonite (oxide of iron), from Virginia.

Object O. Mass of copper-nickel ore, from the Evans mine, Sudbury, Ontario, Canada, taken from the third level at a depth of 175 feet, and weighing about 12,000 pounds. Numerous large deposits of low grade nickel ore have recently been discovered in

the Sudbury district, samples of which assay as high as from 10 per cent. to 35 per cent. nickel. Around the large specimen, described above, is another important ore of nickel, Garnierite, consisting essentially of a hydrated silicate of magnesium and nickel, occurring in the veins traversing the serpentine rock near Noumea, capital of New Caledonia.

Object P. Limonite (brown oxide of iron), from Russia.

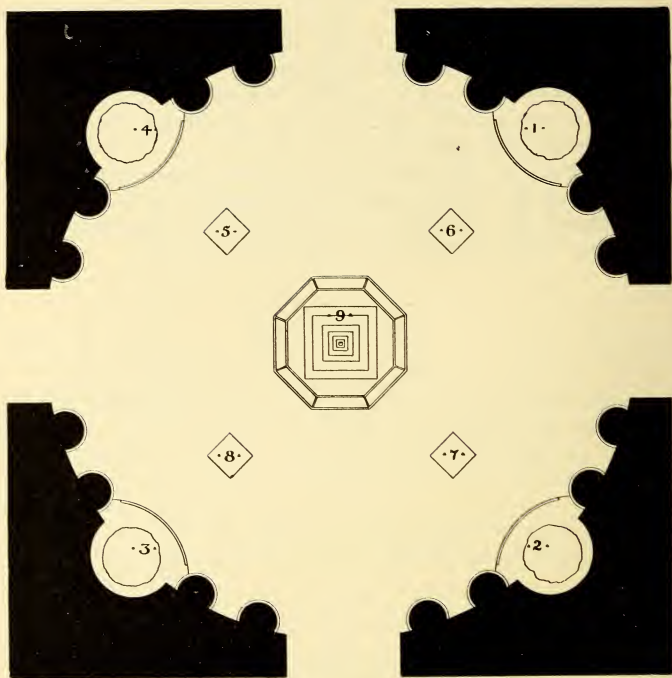
Object Q. Zinc-lead ore, France.

Object R. A tall pyramid of oxidized iron ore, from Greece, and numerous other specimens from different foreign and American localities at the base.

Object S. Hematite (red oxide of iron), Wyoming.

Object T. Copper ore (bornite), Cape Colony, South Africa.

Object U. Large mass of Calamine (zinc silicate), Arkansas. The weight of this mass is about 10,000 pounds.



PLAN OF HALL 80.



HALL 80.

WEST DOME.

Beneath the center of the dome stands a statistical column, giving the bulk of each product of the mines of the United States in 1892, for one second of time. Multiplying this by the number of seconds in the year (31,536,000) will give the annual product. This column was built according to data given by the United States Geological Survey. In the four niches are pyramids of ore, containing:

No. 1.—Gold and Silver Ores.

Gold and silver ore, State of Washington, U. S. A.

Silver ore, from New South Wales.

No. 2.—Tin Ore.

Cassiterite, or tin oxide, in micaceous schist, from New South Wales, Australia, and South Dakota, U. S. A.

No. 3.—Iron Ore.

Red Hematite, from Wyoming and Minnesota, U. S. A.

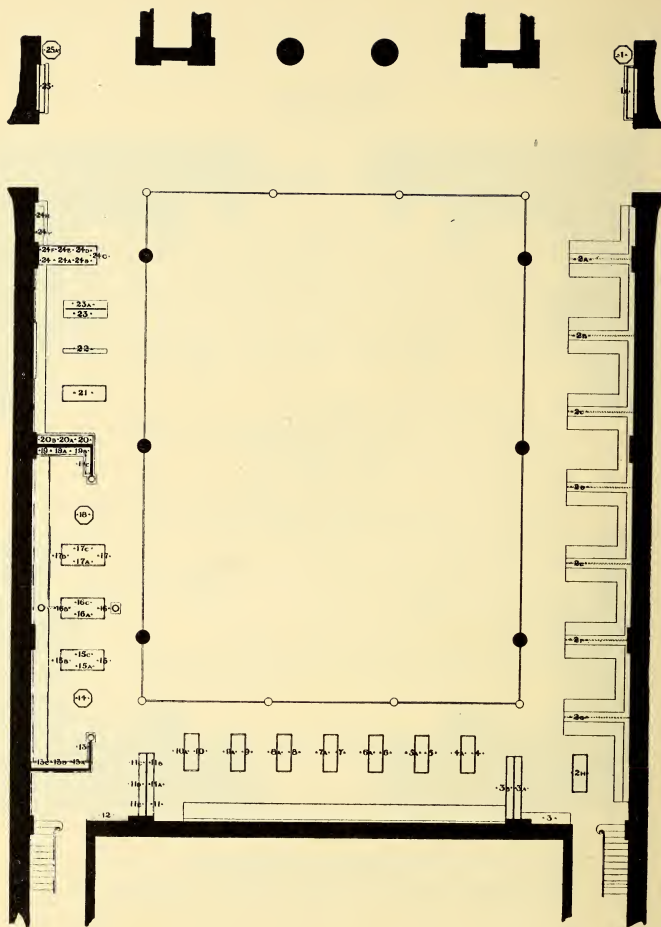
No. 4.—Copper Ores.

Bornite, from Cape Colony, South Africa.

Chalcopyrite, from New South Wales, Australia.

The four large specimens surrounding the column are respectively:

1. Calamine (silicate of zinc), from Arkansas.
2. Silver ore, from New South Wales, Australia.
3. Iron ore (red hematite), from Minnesota.
4. Iron Pyrite (sulphide of iron), Quebec, Canada.



PLAN OF SOUTH GALLERY.



DEPARTMENT OF BOTANY AND PLANT ECONOMICS.

This department occupies the galleries of the North, South, East (in part) and West Courts of the main building, and may be reached by any of the four flights of stairs in the central rotunda, or by the stairways at either side of the east and west main entrances.

The collection of this department comprise, in the main, those of the foreign governments in forestry, as exhibited in their Government Buildings, and in the Forestry Building, at the World's Columbian Exposition; the major portion of the gums, oils, medicinal plants, tan barks, dye woods, seeds and fibers exhibited by the foreign countries in the Agricultural and Manufactures Buildings; the Economic Plant Exhibit of the U. S. Government as exhibited in the Government Building, and portions of many American exhibits in this important branch of natural science.

The general arrangement of the department is as nearly geographic in character as is possible. Beginning at the south-east corner of the south court the visitor travels westward through Russia, Corea, Japan, India, Ceylon, Johore, Siam, Turkey, Spain, and Australia; thence, beginning at the Straits of Magellan, northward through Argentine, Paraguay, Brazil, Venezuela, Trinidad, British Guiana, Ecuador, Colombia, Guatemala, and Mexico, to the United States as far as Alaska, meeting there the starting point, Russia.

The special aim in the installation of the objects in this department has been to insure scientific arrangement, although it is hoped enough display is made to attract and please the general visitor, especially when this could be done without detriment to the natural sequence of species. Sufficient time has not yet elapsed to study into the correctness of the identification labels, that were attached to the specimens when received, and

which principally have so far been retained. This is especially to be remembered by those who desire to enter into discriminative study of the collections. All the identifications will be determined by the Curator of this department as rapidly as is consistent with careful and systematic results, and the labeling will be corrected from time to time until scientific accuracy shall obtain.

GALLERIES OF THE SOUTH COURT.

Cases 1 and 1A.—The Cork Oak (*Quercus suber*) and its utilization.

Among the specimens exhibited is a very fine and costly decoration of a tree with three branches. This specimen is considered to be the best example of dextrous cork-peeling ever procured.

Cases 2A, 2B, 2C, 2D, and the wall space accompanying same, are devoted to the indigenous trees of Illinois.

Notable in this collection is a complete set of the oaks of Illinois, accompanied by water-color representations of the leaves and fruits.

Cases 2E, 2F, 2G, and the accompanying wall space, are devoted to the cultivated trees of Illinois.

Fine examples of Honey Locust, White Ash, and several species of Oak.

Case 2H.—Grains of Illinois.

RUSSIA.

Case 3.—Russian Tobacco. The first tier in this case comprises the original natural species (*Nicotiana rustica*), from which most of the finer cultivated forms have sprung. The balance of the specimens are of the variety known as Turkish leaf, from different sections of the country.

Case 3A.—Russian Flax. In this case may be found excellent specimens of dressed and undressed flax, together with the plants from which this useful fiber is obtained.

Case 3B.—Lime Tree Products. Probably the most useful tree to the Russian peasant is the Lime, or Linden (*Tilia Euro-pæa*), from the bast layers of which many households gain the major portion of their useful appurtenances, even the structure of the dwelling itself, its floor covering and its furniture. Among the specimens will be found the natural bark, the inner layers, the fiber, both crude and macerated, matting, bags, ropes, harness, shoes, trunks, etc.

South Wall.—On the south wall platforms extending through this section will be found the principal commercial timbers of Russia, both in log and plank.

Cases 5, 6, 7, 8, 9, and 10.—These cases contain the cereals and legumes of Russia.

This is probably as complete a collection of the species and varieties of the agricultural seeds of that country as can be found in any Museum in the world.

Case 11.—Turpentine industry of Russia.

This case contains the commercial products of distillation of pine.

COREA.

Cases 11A and 11 B.—A collection of the woods, cereals, nuts, and dried fruits of this peninsula.

A comparison of the woods of this country with those of Japan, near by, will prove interesting.

JAPAN.

Cases 11C, 11D, and 11E.—The fibers, tobaccos, and teas of Japan.

Case 12.—Specimens of insects injurious to useful plants of Japan.

This beautiful and highly scientific collection showing the successive phases of insect development, as well as the injury caused by them to the plants upon which they prey, was prepared

for exhibit in the Japanese section at the Exposition, but on account of lack of space was not unpacked.

Cases 13A, 13B, and 13C.—The construction timbers of Japan.

This set of specimens is particularly interesting to the student, as each wood is accompanied by a section of the bark and by illustrations of the foliage and fruit.

Wall.—Among the specimens here exhibited is a comprehensive series of the commercial timbers of the country in plank, square, bark, and plaque. Each species is accompanied by an illustration of the foliage characteristics similar to those in connection with the construction timbers. Many specimens representing their utilization may be seen. At the south end are three native paintings showing timber operations in Japan; these are particularly interesting on account of their similarity to those carried on in this country.

Case 14.—Standard mounted with the various species of bamboo cultivated in Japan.

Originally no bamboos grew on the islands of the Japanese archipelago, where they are now cultivated to a large extent, and rendered, by husbandry processes, very straight, firm, and useful. The red and brown colorations, spots, ridges, blotches, and other beautifying marks upon these bamboos are also the result of careful and studied cultivation.

Cases 15A, 15B, and 15C.—The Cabinet Woods of Japan.

Case 16.—Minor Forest Products: Starches, Pyroligneous Acid, Fossil Boards, and Charcoal, accompanied by explanatory labels and water-color drawings.

Cases 17A, 17B, and 17C.—Minor Forest Products: Edible Mushrooms, Waxes, Lacquer, and Camphor.

In this case probably the greatest interest lies in the careful consideration of the lacquer industry, which is well represented by water-color drawings and the product itself. The same may be said of the camphor industry, which is similarly and as carefully shown.

Case 18.—Standard of Toko Posts.

The *Toko* is the ornamental place of honor in the Japanese parlor. It is here that ceremonial tea is served. This place

is dear to the heart of the Japanese hostess, and is generally furnished in the height of Japanese neatness and artistic taste. These posts are placed to support the canopy overhead, and are always of some natural unhewn wood, often decorticated, or partially so. The woods chosen for *toko* posts are generally those of high commercial value or especial rarity.

Cases 19A, 19B, and 19C.—Grains and Minor Forest Products.

In this case will be found most of the species of rice of Japan, both natural and whitened; tan barks, dyes, and fibrous barks; also the woods used in the manufacture of paper, together with paper pulp from same.

BRITISH INDIA.

Cases 20, 20A, and 20B.—The Fibers and Minor Forest Products of India.

Wall.—The wall in this section is wainscoted with various species of the commercial timbers of the country, in the center of which is a beautiful *padouk* doorway, and carved blackwood stands for Jardinieres. Along this wall may also be seen blocks of Teak wood, famous as ship building material.

Case 21.—Minor Forest Products.

Stand 22.—A single piece of *padouk* board, six feet eight inches in diameter, cut in a circle, for a table top.

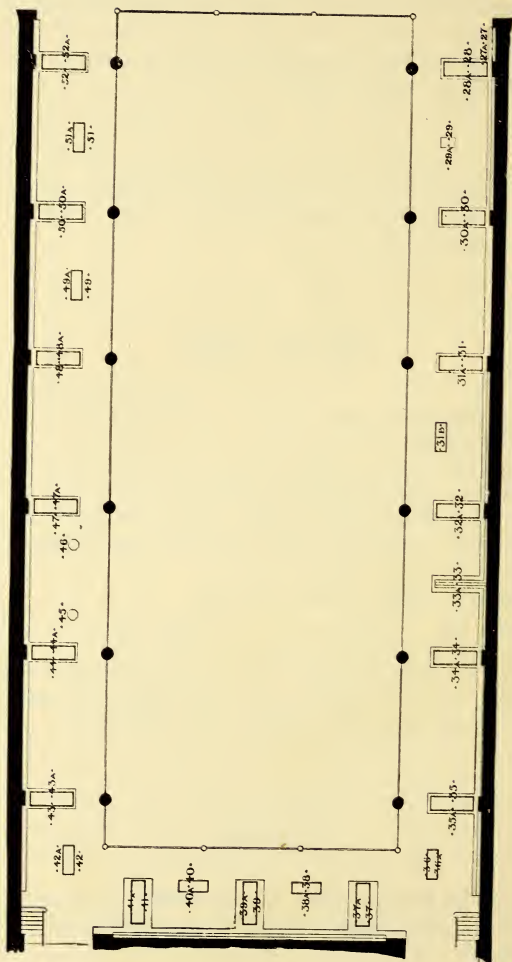
Stands 23 and 23A.—Logs of Commercial Woods.

Notable among which are satin wood and sandal wood. Photographs of teak plantations and the cutch industry.

CEYLON.

Cases 24A and 24B.—The Commercial Woods of Ceylon,

This case also contains many Ceylon products, both of forest and field.



PLAN OF WEST GALLERY.

JOHORE.

Cases 24C, 24D, 24E, 24F, 24G, and 24H.—The woods of Johore, both commercial and non-commercial, together with the minor forest products of the country.

Notable in this case is anatto seed, oil, and paste, so greatly used in the United States in the coloration of butter.

Case 25.—The Rattans and Medicinal Plants of Johore.

Standard 25A.—The Commercial Rattans of Johore.

GALLERIES OF THE WEST COURT.

SIAM.

Case 26.—Siamese Plant Economics. Many curious and noteworthy products are represented, among which will be found gamboge, spiral and zig-zag bamboo, and edible bird's-nests.

TURKEY.

Case 27.—The Woods of Turkey. Even the casual observer will note here the striking resemblance between these woods and those of our own country; particularly is this true of the pine, cedar, oak, ash, cherry, and sycamore.

SPAIN.

Case 27A.—The Woods of Spain.

Case 28.—Economic Plant Products. Especially interesting is the large comparative collection of olive oils, representing the product of various provinces.

NEW SOUTH WALES.

Case 28A.—Minor Forest Products.

Wall and Standard 29 and 29A.—The principal timbers of the country, exhibiting excellent specimens of their cedar, rosewood, beech, and several species of Eucalyptus or gum.

SOUTH SEA ISLANDS.

Case 30.—Sea Fruits.

This designation is given to various odd and curiously shaped fruits, that sailors, particularly those attached to whaling vessels, and others gather upon the beaches of the Pacific Islands, where they have been cast by the waves. The most notable among these fruits is the "Coca de Mer," the largest known tree fruit, which, though curious on account of both its shape and size, has no particular economic value.

PARAGUAY.

Case 30A.—*Maté* or *Yerba*. Paraguay Tea.

The source of *Maté*, the principal drink of South America, is the roasted and powdered younger leaves and twigs of a forest tree belonging to the Holly family.

The beverage is prepared in the same manner as tea is "drawn," and is drunk in hot infusion. Great care is taken, however, to thoroughly strain the liquor, in order that no portion of the powder shall be swallowed. Properly prepared *Maté* forms a pleasant and slightly stimulating morning drink, which may be taken clear, or with sugar or milk, or both.

Platforms.—Upon the platforms of the three Sections devoted to this country may be found an excellent collection of its principal timbers, the largest and most complete in existence; notable species

are *Lignum Vitæ*, *Incense Cedar*, *Quebracho*, and a particularly fine specimen of *Orange Mulberry*.

A complete collection of dyeing and tanning barks, fiber plants, charcoals, and curious llanos may be seen upon the shelves and walls.

Cases 31 and 31A.—Medicinal Plants of Paraguay.

Cases 31B and 31C.—Fiber Plants. This collection is particularly rich in *Bromeliads*.

Cases 32 and 32A.—Economic Plants.

Cases 34.—Paraguayan Seeds, Cereals, and Oils.

BRAZIL.

Case 34A.—The Woods of Santa Catharina and Espiritu Santo.

Though the specimens in these collections are small they represent a very complete and highly valuable series, and are especially useful for study, and comparison with the other states of Brazil.

Walls and Center-piece.—Commercial Woods of Brazil.

The color forms of the Brazilian Pine (*Araucaria*) here exhibited compare well with the highly useful forms of *Cryptomeria* of Japan—forms, it is true, that are due to diseased conditions, but highly ornamental and useful. The beautiful *Pao Amarello* can not fail to attract and please. This species will doubtless be largely exported in the future, as it has attracted very favorable notice here.

Case 35.—The Woods of Pernambuco.

Case 35A.—Minor Forest Products.

Wall.—The Woods of Parana.

This set is one of the most complete and uniform wood collections sent here from this country, and represents a large outlay of time and money. It is also one of the best named collections from Brazil.

Cases 36 and 36A.—Bast Fibers.

Notable in this case is the wonderful "natural oakum," a bast that requires but slight preparation to fit it for the calking iron.

West Wall.—The Woods of Minas Geraes and Para.

A large and valuable set of trunk specimens, notable among which are rosewood, snakewood, violet, and the indispensable Brazilian cedar.

Cases 37 and 37A.—Medicinal Plants.

Brazil is especially rich in medicinal plants. It is from this country that many of our most useful plant medicines are derived; notably, sarsaparilla, copaiva, and quinine.

Cases 38 and 38A.—Rubber.

The principal product of Brazil, next to coffee and sugar, is the so-called India Rubber, for which the Amazon and its tributaries are noted. Seventy-five per cent. of the product is exported to the United States. Nearly all forms of the raw material may be seen in the collection.

Cases 39 and 39A.—Medicinal Plants.

Cases 40 and 40A.—Textile Fibers.

This collection is particularly rich in Palm products.

Cases 41 and 41A.—Gums, Resins, Seeds, and Cereals.

North Wall.—The Woods of Maranhao.

Case 43.—Brazilian Oils.

ECUADOR.

Cases 42 and 42A.—Ecuador Products.

COLOMBIA.

Case 43A.—Minor Forest Products.

Wall.—A series of Colombian Woods.

VENEZUELA.

Wall.—Woods.

This collection, though composed mostly of small specimens, is particularly valuable in that nearly all of the species are authentically identified. It is also a quite complete series, and one of great scientific value.

Case 44.—Minor Forest Products.

BRITISH GUIANA.

Case 44A.—Minor Forest Products.

Wall.—The Woods of British Guiana.

This collection contains many richly colored and valuable timbers, among which the wallaba, green heart, purple heart, and mahogany are especially deserving of careful comparison with the cabinet timbers of any country.

TRINIDAD.

Wall.—The woods of Trinidad excited the most favorable notice of any displayed at the Exposition, both for their beautiful markings, and high permanent color. The magnificent *Saman*, or leopard mahogany, was by far the finest specimen in the Forestry Building, while the angelin and purple heart were wonderful examples of high color in wood. This collection forms one of the brightest color spots in the galleries.

CURAÇAO.

Case 47.—Economic Plants and Fruits.

GUATEMALA.

Wall.—The Woods of Guatemala.

This collection, though large in number of species, can hardly be said to properly represent the valuable timbers of the country, as unfortunately most of the specimens are from young growths, and, to a large extent, devoid of heartwood. The collection is also somewhat deficient in nomenclature, yet withal, upon further study, it will become one of rare worth, from its complete representation of the Guatamalan sylvia.

Case 48.—Guatamalan Forest Products.

JAMAICA.

Case 48A.—Minor Forest Products.

This collection is particularly rich in starches—Arrow-root, mandioca, and banana meal being excellently represented.

Wall.—The Woods of Jamaica.

An excellent and very complete collection of the principal woods of the Islands.

MEXICO.

Cases 49 and 49A.—Mexican fibers.

Cases 50 and 50A.—Mexican seeds, cereals, gums and oils.

Wall.—This space is designed for the timbers of Mexico, of which the museum secured a large and complete set, now in preparation for installation.

Cases 51 and 51A.—Mexican textiles.

Cases 52 and 52A.—Medicinal plants of Mexico.

DESTRUCTIVE DISTILLATION OF WOOD.

Case 53.—Monographic set. This set includes almost all of the products of the destructive distillation of the beech and birch; notable among which are creosote, acetic acid, methyl alcohol, benzol, benzene, and oil of birch.

GALLERIES OF THE NORTH COURT.

Case 54.—Insects injurious to the paper pulp industry. A complete and very interesting monographic collection of the insect enemies of the spruce tree of Europe, showing the mutations of each species, and examples of the injury wrought by them.

ECONOMIC PLANTS.

Cases 55 to 55A.—Tobacco. These cases contain nearly four hundred samples of American grown tobaccos, from almost every producing district of the United States. A very complete and highly important comparative collection, both from the standpoint of the student and the merchant.

COTTONS.

- Case 60.**—Texas and Arkansas cottons.
- Case 60A.**—Arkansas and Tennessee cottons.
- Case 61.**—Mississippi and Louisiana cottons.
- Case 61A.**—Louisiana and Texas cottons.
- Case 62.**—Virginia and North Carolina cottons.
- Case 62A.**—Georgia and South Carolina cottons.
- Case 63.**—Georgia cottons.
- Case 63A.**—Alabama and Mississippi cottons.
- Case 64.**—Georgia, Florida, and Missouri cottons.

FIBERS.

- Case 65.**—Ramie.
- Case 65A.**—*Abutilon*, Okra, *Asclepias*, and Indian hemp.
- Case 66.**—Manila Hemp, Ixtle and *Yuca*.
- Case 66A.**—Bow String Hemp, Saw and Cabbage Palmetto.
- Case 67.**—Flax plants.
- Case 68.**—Florida Sisal.
- Case 68A.**—Mexican Sisal, False Sisal.
- Case 69A.**—New Zealand Flax.
- Case 69B.**—Louisiana Cane Fiber.
- Case 69C.**—Pineapple Fiber.
- Case 70.**—Spanish Moss, Cypress Bark, Raphia, and Grass.
- Case 71A.**—Intermixed Ramie and Silk.
- Case 71B.**—Dressed Flax.
- Case 71C.**—Ramie Yarns, natural and dyed.
- Case 72.**—Saw Palmetto and African Fiber.
- Case 72A.**—Cocoanut and Pine-Needle Fibers.
- Case 73 and 73A.**—Dressed and undressed Flax.

SYLVA OF THE UNITED STATES.

West Wall.—A nearly complete collection of the Leaves, Fruits, and Woods of the trees of our country, accompanied by graphic maps showing the distribution of each species. This fine collection is arranged systematically, and affords an excellent opportunity for comparison between allied woods. The richness of our sylva in oaks and conifers is strikingly exemplified.

Cases 74 to 78A.—A set of twenty monographs of North American trees. Each species in this set is illustrated by a large distribution map; photo-micrographs of three sections of the wood, horizontal, tangential, and radial; a branch in full leaf and fruit; microscopic sections of the wood in three planes, and a section of trunk showing the bark.

Standards 79 and 79A.—Specimens of pine, showing the method of tapping for turpentine.

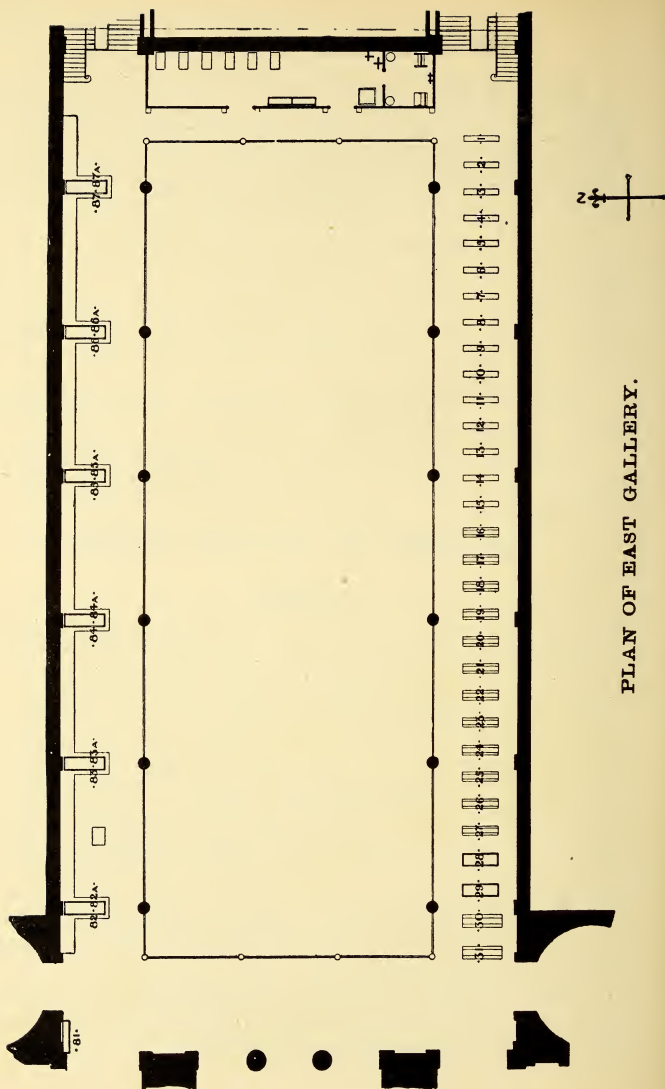
Case 80.—Indurated fiber ware. Examples, crude and finished, of the method of converting spruce wood into various household articles.

GALLERIES OF THE EAST COURT.

These galleries, now temporarily occupied by a miscellaneous collection in forestry, and a portion of the anthropological collection, are reserved for a complete forestry and economic plant collection of North America, to be specially made by this department. The various home forestry collections exhibited at the Exposition that were obtainable by the Museum were mostly of a more or less heterogeneous character as to shape and size, and of an ephemeral nature, as they were gathered while the sap was in the pores of the wood, and had commenced to decay in large part before the end of the Fair. For these reasons a few especially fine or rare specimens only were retained, which will be found upon the platforms along the North wall.

Case 81.—Paper pulp. Crude and partially manufactured specimens, showing the utilization of spruce wood for the manufacture of all grades of paper.

Tree Planter.—A model of an extremely ingenious implement, devised by Mr. Fernow, chief forester of the United States, and adapted to tree-planting upon large areas.



PLAN OF EAST GALLERY.

Cases 82 and 83 and Walls.—Timber tests. Standards representing the results of strain upon various species of American timbers.

Between **Cases 83 and 84** may be seen the two broadest boards ever sawn, both being specimens of the sugar pine of California. Here also are exhibited several fine examples of plain and curly yellow poplar from Kentucky.

Between **Cases 84 and 85** various species of trees from Kentucky, Washington, Oregon, and California may be seen. Notable among these are particularly large sections of madrone, beech, pecan, and sweet gum.

Between **Cases 85 and 86** are several excellent specimens of the commercial woods of Canada, notable among them the paper birch.

Between **Cases 86 and 87**, British Columbia woods, represented by several especially fine sections. Beyond Case 87, at the end of the Section, may be seen four excellent examples of the principal timber trees of Alaska.

OF SPECIAL INTEREST.

The Bamboos. Southwest rotunda stairway.

The Cork Tree. Northeast corner of South Court galleries.

The Japan collection. Southwest end of South Court galleries.

The collection of Teak, Sandal Wood, and Padouk in the British Indian section, South Court galleries.

The Paraguayan collection. South gallery in West Court.

The woods of British Guiana and Trinidad. North gallery of West Court.

The Insect collection. Southwest corner of North Court galleries.

The Tobacco, Cotton, and Fiber collection. In North Court gallery.

The type species and marine plants, in the standards along the rail of the North gallery, North Court. Here may be seen the close form relationship of vegetable to animal life, the apparent "missing link."

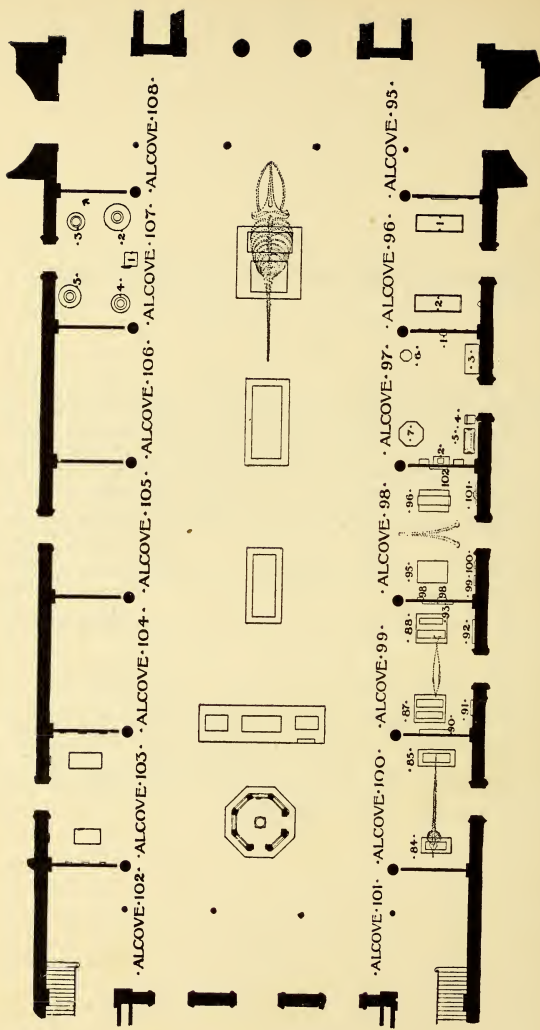
The wide boards and immense beech, in the North gallery of the East Court.

DEPARTMENT OF ZOOLOGY.

The collections of the Department of Zoology are very extensive, covering fully this field of science from *Protozoa* to man.

The classification begins with the lowest forms of life, in Hall 24, and follows in ascending scale through the halls in serial order, ending in a special geographical collection (Hall 19) from the Galapágos Islands. The collections are especially rich in several divisions, as for example: the *Sub-kingdom Mollusca*, in which is nearly every family, genus and sub-genus, at present described; also the collection of corals (*Sub-kingdom Cœlenterata*), which is unusually rich in species of great interest. The Osteological collection is one of great value, and contains many very rare specimens.

The classification adopted is essentially that of the best German and French *savants*, with such additions as modern American investigations have made necessary.



PLAN OF WEST COURT.

ALCOVE 24.

- 95.**—Walrus.
96.—Rhinoceros skeleton.
97.—Jaws of Sperm Whale.
98A and B.—Skin and skeleton of Harbor Seal.
99 and 100.—Two varieties of fur-bearing Seal.
101.—A fine specimen of the Loggerhead Turtle.
102.—Sea Elephant.
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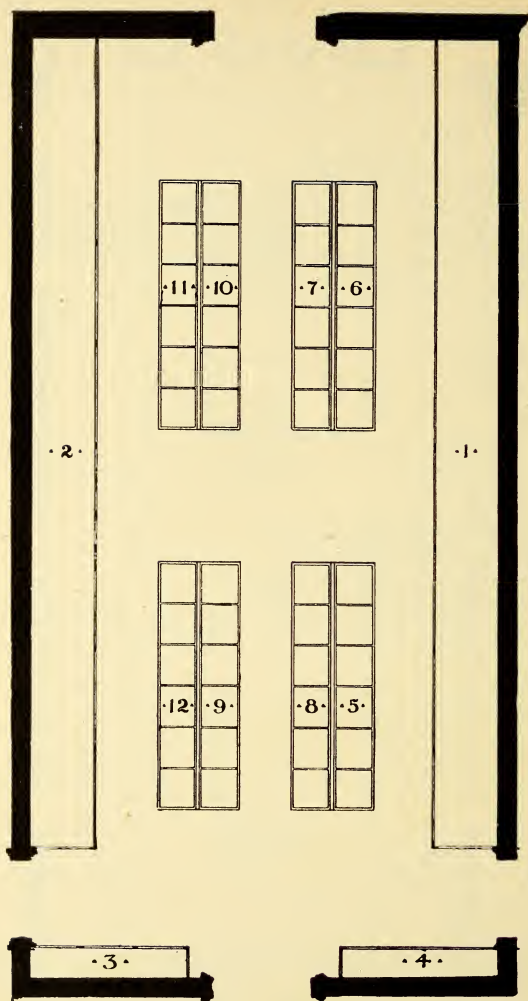
ALCOVE 25.

- 87.**—Male and female Moose.
88.—Male and female Elk.
89.—Model of Sowerby's Whale.
90.—Giant Crab, the largest living crab.
91 and 92.—Loggerhead and Carey Turtles, of very large size.
93.—*Alligator Lucius*, from Lake Worth, Florida.
-

ALCOVE 26.

84 and 85—Mounted skin and skeleton of the Giraffe. The skeleton measures thirteen feet in height from the floor to the tip of the horns.

86.—Suspended over the doorway, a large skeleton of the Bottle Nose Whale, from the North Sea.



PLAN OF HALL 24.



HALL 24.

LOWER INVERTEBRATES.

Entering from Hall 23.

Case 1.—A collection of models of the simplest forms of animal life (*Branch I,—Protozoa*), commonly known as animalcules. These are magnified 2,300 times, and are faithful representations of these curious animals. Just below a collection of sponges (*Branch II,—Porifera*), among which are the curious Neptune's Cup, the Glass-rope Sponge, and the Venus Flower-basket.

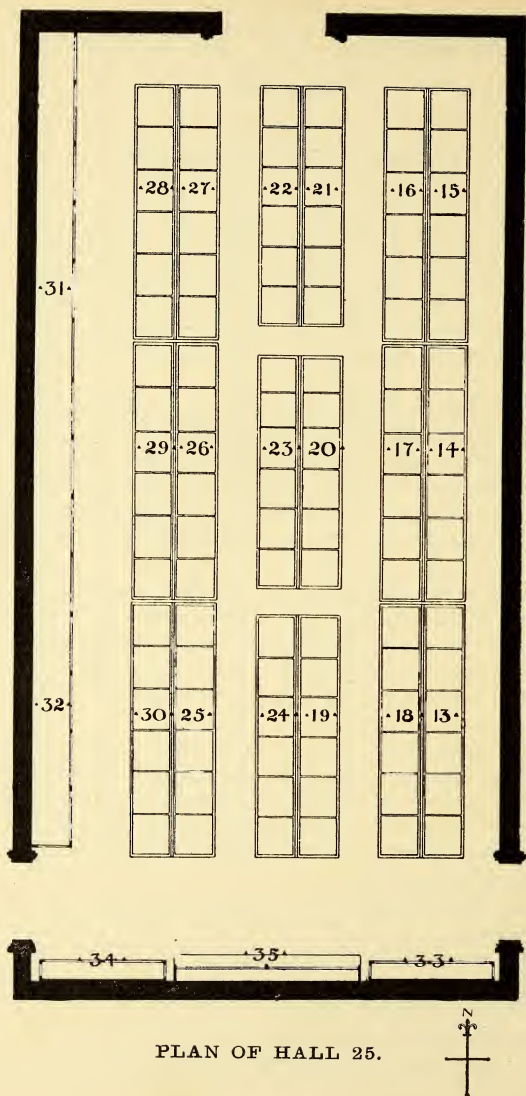
To the left of the sponges are the corals (*Branch III,—Cœlenterata*), those beautiful creatures which have been instrumental in building many of the islands in the tropical seas. Among these are a number of glass models of jelly-fish, the Portuguese Man-of-War, and several sea-anemones. Of great interest among these models are the two groups of sea-anemones at the back of Case 1.

Case 2, on the opposite side of the Hall.—A continuation of the corals. In the left hand side of this case is a fine collection of sea-fans and sea-plumes (*Alcyonaria*), those flowers of the sea. Among these as of special interest is the large specimen of the Tree Gorgonia (*Paragorgia*), which grows to a height of fifteen or twenty feet.

Table-Case 5 contains the first class of the star-fishes (*Echinodermata*), the Crinoids, or sea-lilies, beautiful animals mounted upon a pedicel or stalk, the Ophiurians, or serpent-stars, and the Astrophytons, or basket-fish. These last receive their name from their peculiar habit of curling into the form of a basket when taken from the water.

Cases 6, 7, and 8.—The typical star-fishes, the five-fingers so familiar to every one. In Case 7 are seen several examples of the repairing of broken arms in this family. In Case 8 the spiny-stars (*Acanthaster*) show to what peculiar modifications these curious animals are subject.

Cases 9, 10, 11, and 12.—The Echinoids, or sea-urchins. Many of these have been dredged at great depths. In the left hand side of Case 10 is seen the large Edible Urchin (*Echinus*



PLAN OF HALL 25.

esculentus) which is used for food in France. Cases 11 and 12 contain the key-hole urchins and sand-dollars, curious flat animals of very peculiar growth. In Case 12 are seen the Holothurians, or sea-cucumbers, which the people of the Celestial Empire use as food. The latter part of Case 12 is devoted to the collection of Worms (*Branch IV,—Vermes*), of which the most peculiar are the glass model of *Serpula* and the Bryozoans, or moss animals.

Case 4.—Several star-fishes of unusual size. Of especial interest is the group of urchins (*Strongylocentrotus*), showing the manner in which these curious animals live.

Case 3.—Principally an alcoholic collection of star-fishes, sea-urchins, and sea-cucumbers. Of especial interest are the three specimens of the sea-lily (*Pentacrinus*) in alcohol, and the wax model of the devil-fish (*Eledone*).

Suspended over the table-cases is a life-sized model of the largest known Octopus, or devil-fish.

HALL 25.

HIGHER INVERTEBRATES.

Entrance from Hall 24.

Case 13.—The last order of the Worms, the *Brachiopods*, or lamp-shells. Following these is the first order of the *Sub-kingdom Mollusca*. The collection begins with the lowest forms of these animals, known as clams. Of special interest in this case are pieces of wood bored by the Ship-worm, or *Teredo*, and a piece of massive stone pierced by the *Pholas*. At the right hand end of this case is seen a clam with its siphon or snout fully extended.

Case 14.—Collection of round-clams, or quahaugs.

Case 15.—Collection of the fresh-water clams of the United States, with a few representatives from foreign countries. Of especial interest are the fresh-water clams from Japan, showing the manner of artificially producing pearls.

Case 16.—Continuation of the fresh-water clams and the mussel family. Note the glove, cap, and muff made from the bissus of the *Pinna*.

Case 17.—A fine collection of *Aviculæ*, or pearl oysters, among which are the four beautiful carvings of extreme beauty from Taranto, Italy.

Case 18.—Various members of the oyster family, the elephant-tooth shells, the *Chitons*, or coat-of-mail shells, and the *Patellas*, or limpets. In the left hand end of this case is a specimen of oyster which was found attached to the back of a land tortoise.

Cases 19, 20, and 21.—Various groups of the univalves. Note especially the *Trochus*, or top-shells, the *Haliotis*, or ear-shells (19), the *Natica*, or moon-shells (20), and the *Vermetus*, or worm-shells (21).

Cases 22 and 23.—*Cypræas*, or cowrys, and the *Cassis*, or helmet-shells.

Case 24.—Collection of *Murex*, or rock-shell, among which are many beautiful examples of this rare family. At the right end of the case is a fine collection of the *Buccinum*, or whelks,—hardy shells from the North Sea.

Cases 25 and 26.—Collections of *Volutes*, or bat-shells and *Olivas*, or olive-shells. The ends of Cases 26 and 27 are devoted to the collections of the family of *Cones*, among which are several rare examples of this beautiful family.

Case 27.—Mostly collections of the sea-slugs (*Nudibranchiata*), represented by a large number of beautiful glass models and colored drawings made from the living animals.

Cases 28 and 29.—A large collection of land shells.

Case 30.—Collection of *Cephalopods*, or devil-fishes, represented by many beautiful glass models and colored drawings. Of especial interest is the set of Paper Nautilus, showing the female, the male, and the shell; also a model of the animal and shell of the Pearly Nautilus.

Case 33.—Collection of devil-fishes in alcohol. Of unusual interest is the alcoholic specimen of the Pearly Nautilus, with the animal placed *in situ* in the shell.

Case 34.—A number of shells of extraordinary size.

Case 31.—Collection of crabs and sea-spiders (*Crustacea*). Of especial interest are large specimens of the lobster, the horse-shoe group, and the shrimp.

Case 32.—A collection of 2,000 species of butterflies (*Lepi-*

doptera). Note the large metallic-blue moths from South America, and the beautiful hawk-moths from the United States and Europe.

Case 35.—Collection of photographs of microscopic slides, showing injected specimens of the tongue, ear, muscles, etc.

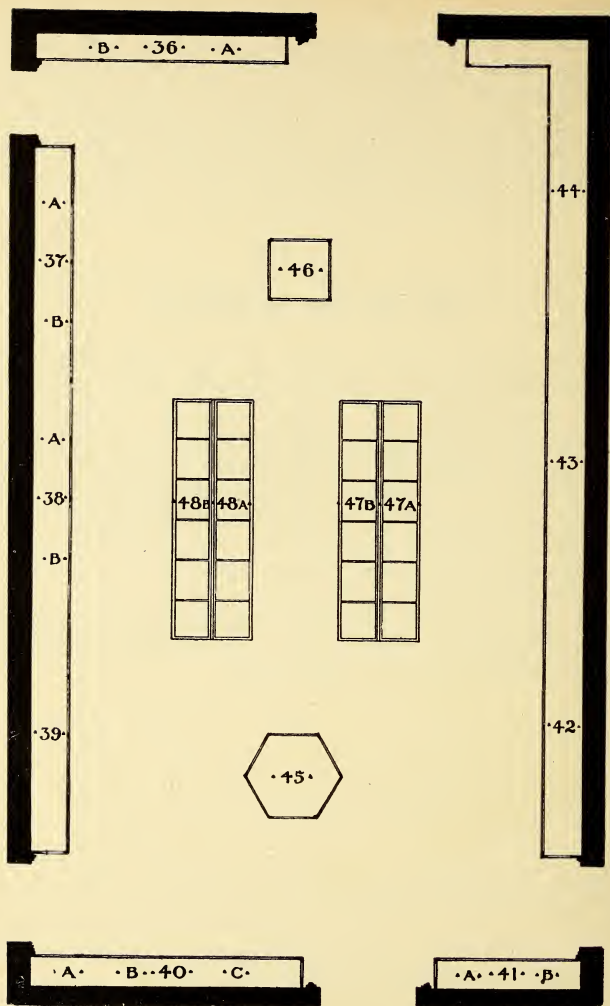
Suspended over the table-cases is a life-size model of a large squid. The original was found off the coast of Newfoundland in 1876.

OF SPECIAL INTEREST.

The collection of the Mollusca is one of great value to the student, inasmuch as it is arranged with strict regard to the most recent classification. The larger classes, orders, etc., are explained upon tablets, giving the characteristics of each group. The especial value of the collection is not the number of individual specimens it contains, but the large number of genera and subgenera represented, making the collection as a whole an excellent manual of Malacology.

The beautiful collection of glass models in this sub-kingdom is of particular excellence.

The collection of Lepidoptera is also one of great value, the collection numbering 2,000 species. It is one of the largest collections of this order in the United States.



PLAN OF HALL 26.

HALL 26.

ORNITHOLOGY.

Entering from the west court.

Case 36A.—*Sub-class Ratitae*, represented by the ostrich, emu, Kiwi Kiwi, and apteryx.

Case 36B.—The *Order Pygopodes* (diving birds), consisting of the penguins, auks, puffins, grebes, and loons.

Case 37A.—The *Order Longipennes* (long-winged swimmers), represented by the petrel, gull, and terns.

Case 37B.—The *Order Stegopodes* (Totipalmate birds), comprising the frigate-bird, snake-bird, cormorants, pelicans, and gannets.

Case 38A.—The *Order Lamellirosteres*, represented by the duck, geese, mergansers, and swans.

Case 38B.—The *Order Grallatores* (wading birds), represented by the cranes, rails, herons, snipe, plover, curlew, and gallinules.

Case 39.—The *Order Gallinae* (gallinaceous birds), comprising the partridge, quail, ptarmigan, grouse, turkey, and guinea hens.

Case 40B.—The *Order Columbæ* (doves, etc.), represented by the pigeons and doves.

Case 40C and 41A.—The *Order Raptores* (raptorial birds), represented by the buzzards, vultures, falcons, hawks, eagles, and owls.

Case 41B.—The *Order Psittaci*, represented by the parrots and paroquets.

Case 42.—The *Order Picariae* (woodpeckers), comprising the woodpeckers, cuckoos, swifts, humming-birds, horn-bills, kingfishers, and toucans.

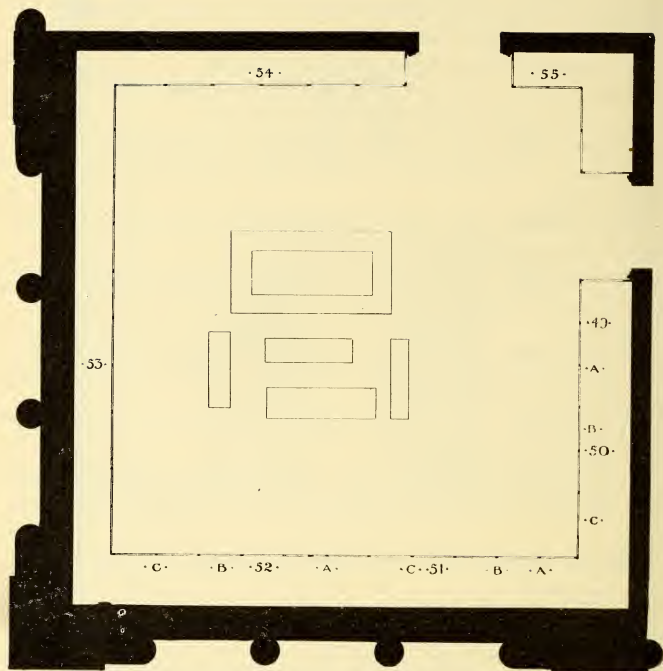
Cases 43 and 44.—The *Order Passeres* (perching birds), comprising the magpie, fly-catchers, pewees, lyre-bird, crow, black-bird, birds of paradise, oriole, bobolink, song-sparrow, warblers, and robins.

Case 46.—A group consisting of the ostrich, young and egg.

Case 45.—A group consisting of large cranes and herons. Horn-bill in nest on top of case.

Case 47.—A collection of North American and foreign eggs, and Hummingbird from South America.

Case 48.—A collection of North American bird skins.



PLAN OF HALL 27.



HALL 27.

OSTEOLOGY.

Entrance from Hall 20.

Case 49.—Fishes (*Class Pisces*), among which are the mud-fish, gar-pike, shark, and perch.

Case 50A.—(The floor.) The Batrachians (*Class Batrachia*), among which are salamanders and frogs.

Case 50B.—Reptiles (*Class Reptilia*), among which are the python, gavial, alligator, carey, iguana, and a fine series of turtles.

Cases 50C and 51A.—Birds (*Class Aves*) consisting of the ostrich, emu, crane, parrot, pelican, spoonbill, pigeon, peacock, etc.

Case 51B.—The first order of the Mammalia (*Order Monotremata*) represented by the Duck-billed Platypus and the Echidna; the Marsupials (*Order Marsupialia*), consisting of the kangaroo, opossum, and phalangus, and the Cetaceans (*Order Cete*), represented by the porpoise and whale.

The Edentates (*Order Bruta*), represented by the armadillo, ant-eater, and sloths.

Case 52A.—The Rodents (*Order Glires*) represented by the squirrels, rats, mice, and woodchucks.

Case 52BC.—Moles and shrews (*Order Insectivora*), the bats (*Order Chiroptera*), a few specimens of the Ungulates, and the *Order Sirenia*, represented by the Dugong.

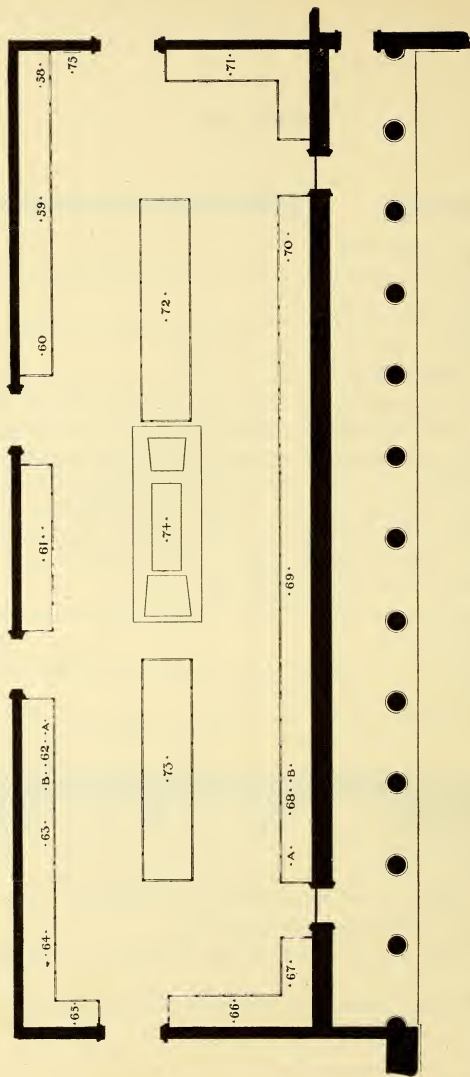
Case 53.—The Ungulates (*Order Ungulata*), represented by the deer, elk, moose, Rocky Mountain Sheep, Musk Ox, etc., etc.

Cases 54 and 55A.—The Carnivores (*Order Carnivora*), represented by the lion, tiger, bear, fox, wolf, seal, etc.

Case 55B.—The *Order Primates*, or monkeys, represented by the gorilla, chimpanzee, marmoset, etc.

Case 56.—The skeleton of the elephant on a raised platform.

Case 57.—A number of skeletons of the elk, hippopotamus, moose, etc.



PLAN OF HALL 20.

HALL 20.

VERTEBRATE ZOOLOGY.

Entrance from Hall 19.

Case 58.—First and lowest class of the Vertebrates, the *Tunicata*, or sea-squirts, represented by several beautiful glass models. In the same case, on the next shelf above, is a single representation of the class *Marsipobranchii*, the Lamprey.

Cases 58 and 59.—The first group of true fishes (*Class Pisces*), the sub-class *Elasmobranchii*, or sharks and rays. Among the more important members of this group are the Hammer head Shark and the specimen of the torpedo.

Case 60.—In this Case are the two remaining sub-classes of Pisces (*Ganoidea* and *Teleostei*), among which are found the Electric Eel from the Orinoco River, a large gar-pike, several specimens of perch, herring, and mud-fish, and a beautiful specimen of the sword-fish. In the left hand end of Case 59 is exhibited the class *Batrachia* represented by several specimens of the salamanders.

Case 61.—The collection of Reptiles (*Class Reptilia*), consisting of lizards, snakes, turtles, and crocodiles. Of special interest are the large Indian Python, the rattle-snake, the tortoise, chameleon, iguana, and crocodile.

Case 62A.—The lowest order of Mammalia (*Order Monotremata*) represented by two specimens each of the Duckbill Platypus and the Echidna. The Duckbill is curious from the fact that it lays an egg, has webbed feet, and the bill of a duck.

Case 62B.—The Marsupials (*Order Marsupialia*) are represented by the kangaroo and the opossum. The specimen of the female kangaroo, carrying its young in its pouch, and the Virginia Opossum, carrying its young on its back, are of special interest.

Case 63.—The Order *Bruta* (*Edentata*), represented by the ant-eaters, the armadillos, and the sloths.

Case 64.—The Order *Glires* (*Rodentia*), consisting of the squirrels, rats, mice, and rabbits. Of special interest are the

groups of the common gray squirrel, the beaver, the porcupine, and the Capybara, the largest of existing rodents, pig-like in appearance.

Case 65.—The *Order Insectivora*, consisting of the moles and shrews.

Case 66.—The *Order Chiroptera* (the bats), of which the collection is unusually large.

Case 67.—The *Order Cete*, the whales and porpoises, represented by several *papier mache* models of the whale, grampus, and common porpoise.

Case 68A.—The *Order Sirenia*, represented by the Manatee and the Dugong.

Case 68B.—The *Order Ungulata*, to which the larger number of mammals belong. The order begins with the Llama and the Alpaca, two interesting animals from South America. Following these are the groups of deer and antelope. Of great interest is a beautiful pair of the rare Rocky Mountain Goat.

Case 69.—The *Order Carnivora*, containing the cat and dog families. Of special note are the group of the skunks, the otter, the panther, the fine specimens of the gray wolf and the handsome specimens of the lynx.

Case 70.—The *Order Primates*, the last and highest order of the mammalia,—the monkeys. Several fine specimens of the marmoset and many specimens of the long-tailed monkeys.

Case 71.—A collection of plaster casts of German fishes.

Case 72.—A large collection of mammals arranged in groups. Of special note are the group of the panther, consisting of male, female, and young, the large specimen of the mandrill, the gorilla, the pair of lions and tigers, the male, female, and young Grizzly Bear, and the fine specimen of the Polar Bear.

Case 73.—A number of horned animals, among which are the Rocky Mountain Sheep, the Musk Ox (a very fine specimen), and the old and young bison group.

Case 74.—In the center of the Hall, upon a raised platform, are excellent specimens of male and young elephant, sea lion, and fur seal.

On the Wall, No. 75.—Near the entrance from Hall 19 is a specimen of the gavia.

OF SPECIAL INTEREST.

The rare Rocky Mountain Sheep, and the Musk Ox in Case 73. These are both rare in museums and the specimens are of the best.

The Rocky Mountain Goat, in Case 69, is now fast becoming extinct and before many years will be unobtainable. The museum specimens are a male and female and most excellent specimens.

The collection of plaster casts of food fishes in Case 71 is of great economic value, nearly every food fish being represented. The male and young elephant, on the raised platform in the center of the room, deserves careful observation.

HALL 19.

FAUNA OF THE GALAPAGOS ISLANDS.

This room contains a collection of the Land-fauna of the Galapagos Islands, made during a visit of three months in 1891, by Prof. G. Baur, Clark University, now of the University of Chicago, and the late Mr. C. F. Adams, of Champaign, Ill.

The Galapagos, well known through Darwin's visit in 1835, are placed on the equator, about 600 miles west of Ecuador, to which state they belong.

The most peculiar animals are the gigantic land-tortoises, which formerly were found in great numbers on nearly all the islands, but which to-day are restricted to two or three. The largest tortoise ever taken away from the Islands was secured on Albemarle and is on exhibition. Very characteristic are also two large genera of Iguanas, only found there, one *Amblyrhynchus* reaching a length of four feet, found on the sea-shore, and another, *Conolophus*, found inland. Of Mammals only a bat and a small rodent is found, which are both peculiar to the Galapagos.

Of the greatest interest, however, is the fact that each or nearly each island contains a peculiar fauna; but all these faunas are very closely related to each other, leaving no doubt that all these islands formerly consisted of one large island, which at a

still earlier period was probably connected with Central America. By the subsidence of this large island the small islands originated. There is no place in the world where variation can be studied better than here.

Case 1.—Shows the variation of the birds on the different islands. Nesominens, for instance, has a peculiar representative on Hood, Chatham, Albemarle, Abingdon, Tower, Charles; the more central islands, Indefatigable, James, Jervis, having a common representative. The same is true for Certhidia, which shows also different species on the different islands.

Case 2.—Shows the variation of the Lizard *Tropidurus*. Nearly every island has developed a peculiar race or species; and exactly as in the Bird mentioned. There is never more than one race or species found on one island.

Cases 3, 4, and 5.—Exhibit the Birds found on the Islands. Those which do not occur elsewhere are specially labeled. Among these may be specially noticed a fine series of *Creagrus furcatus*, Neboux, a gull exceedingly rare in collections, and the peculiar Penguin *Spheniscus mendiculus*, Sunder.

Case 6.—Contains the Orthoptera, Trachnids, Mollusks, and other Invertebrates.

DEPARTMENT OF ANTHROPOLOGY.

The collections brought together in the Department of Anthropology are intended mainly to illustrate the more primitive or uncivilized phases of the development of the human race, but certain other features relating to more advanced culture are introduced for purposes of comparison, or to present in a single view the evolution of some art or institution.

There are two well marked divisions of this subject, and the materials illustrating them are separately installed. One relates to man himself, to his physical and mental constitution and powers, and the other to the works of his hands, to the visible phenomena of culture. The first division consists of apparatus used in studying the greatly varied physical and psychical phenomena, and of extensive collections of crania and other materials, objects and articles illustrating the races of men and their peculiarities. These exhibits are arranged in the gallery of the east court. The second division, comprising very extensive exhibits of the handiwork of man, are placed on the main floor of the south-east section of the building.

The works of living or historic peoples, are for the most part assembled according to the tribe or nation to which they pertain; those of prehistoric peoples are brought together in groups, according to the locality from which they are derived, to the people, time, or stage of progress they are thought to represent, or with reference to some other special subject to be illustrated.

The various groups thus indicated are placed in the halls in an order or sequence corresponding as far as possible with their original geographic relations. In this way the various objects and articles, and through them the peoples represented, are conveniently studied and compared.

Other groups of art products are brought together to illustrate special subjects, or to facilitate comparative study in some important direction, as exemplified in the room devoted to the paraphernalia of religion.

A large portion of the collections exhibited in the Department of Anthropology was made for the Department of Ethnology of the World's Columbian Exposition, the Chief of which endeavored to bring together a series of collections illustrating all the salient features of American primitive culture in prehistoric times, as well as in modern times. The following regions were selected as fields of exploration: Peru, Bolivia, Ecuador, Venezuela, Costa Rica, Yucatan, California, the North Pacific Coast, the Northwest Territories of Canada, Northern Alaska, Greenland, Delaware and Ohio. For this reason the collections from these countries are the fullest and most systematical among the collections in the Anthropological Department of the Museum. There was inaugurated a special investigation on the physical characteristics of the American race, the results of which form a part of the collections of the Museum.

The primitive culture of the Indian has disappeared rapidly during the last decade, so that at this date full collections can be made with difficulty only. The great collection of Mr. Ed. E. Ayer fills this gap most happily, and occupies a place in the Museum which it would be extremely difficult to supply.

The American collections enumerated above are supplemented by the large and valuable collection of Emilio Montes, from Peru; the collection exhibited by the United States of Colombia in the Colombia Building of the World's Columbian Exposition; the Hassler collection, from Paraguay; the Bruce collection, from Alaska; the results of the explorations conducted by the Peabody Museum in Honduras from 1891 to 1893; the Charnay collection of casts from Central America; the Berlin and Guatemala collections of reliefs.

Among the larger collections from foreign countries must be mentioned the Finsch collection, from New Guinea; the Peace collection, from New Caledonia; the Remenyi collection, from South Africa; and the Schahovskoy collection, from Siberia.

The Anthropological Department occupies the South Court, the Southeast wing of the building, the alcoves of the East Court, the Southern series of Halls of the Northeast wing, and the East and South Galleries of the East Court.

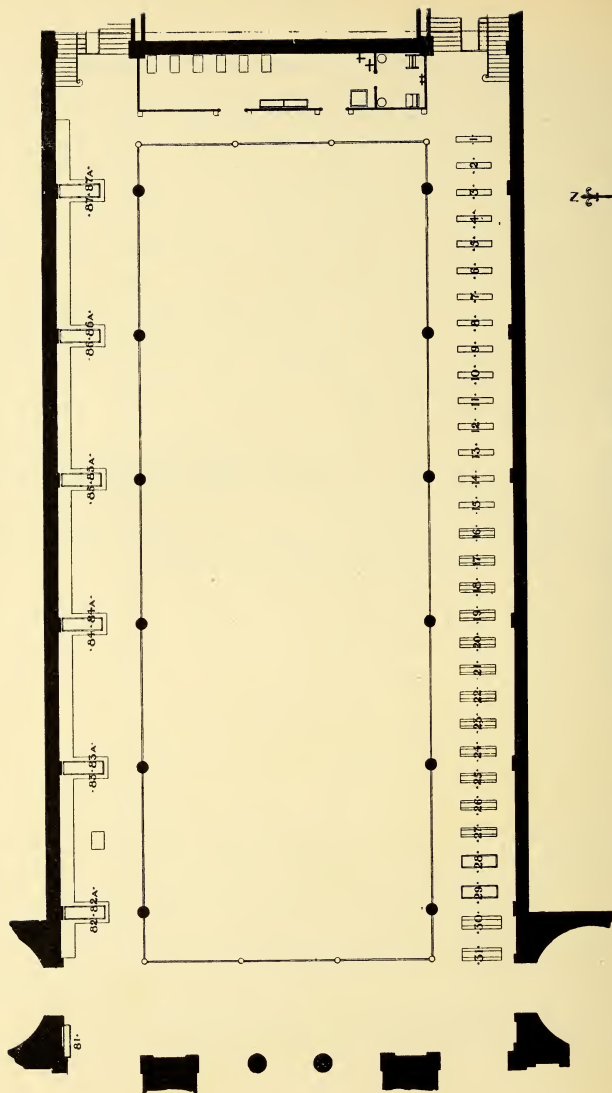
The South Court is devoted to large objects, mainly reproductions of Central American antiquities, and a series of the Totem Poles from the North Pacific Coast.

The Southeast wing is devoted to the Ethnology of America. The visitor when entering Hall 10, finds himself among collections from the Alaskan Eskimos; going through the South series of halls he follows the Arctic Coast of America, southward along the Atlantic Coast of North America, and reaches, in Halls 17 and 16, the Atlantic Coast of South America. Following the Northern series of Halls in the Northeast wing, he returns northward along the Pacific Coast of South America and North America, and again reaches Alaska in Hall 12.

Hall 11 is devoted to an exhibit of comparative religions. The Southern alcoves of the East Court continue the subject-matter of the adjoining halls, and the exhibits from the North Pacific Coast, from Peru, and from the Atlantic Coast of South America may be entered from these alcoves.

Halls 2 and 3 and the alcoves on the North side of the East Court are devoted to North American archeology. The rest of the Halls of the North side are devoted to the ethnology of the various continents except America.

Beginning at the West end, are to be found Oceanica, Asia. Africa, and, finally, a special exhibit from China.



PLAN OF EAST GALLERY.

PHYSICAL ANTHROPOLOGY.

The section of Physical Anthropology is situated on the East and South Galleries of the East Court. On the East Gallery is the Anthropometric Laboratory. In this laboratory are anthropological and and psychological apparatus. The object of the group of psychological apparatus here exhibited is to illustrate the methods of making mental measurements, and tests to furnish an opportunity for accumulation of results in this direction. Upon the several tables are arranged apparatus for the study of the sensibility of the skin, the accuracy of the information obtained by movements, the judging of weights, and the limit of the sensations of pain.

In the field of sight, tests are made of the accuracy with which the lengths of lines can be judged, the accuracy with which spaces can be divided, the accuracy of aim or the coördination of the eye and mind, the accuracy with which lines may be copied, the quickness of perception in deducting small differences between marks and the like. Optical tests are also made of the accuracy of the vision at a given distance, in the perception of form and also the delicacy of color and shade distinctions.

More complex experiments attempt to determine the range and accuracy of the memory in its various forms and of the powers of association. A special set of apparatus determines to the nearest hundredth of a second, the time needed in responding to sound or a touch, of the visual impression, also the time needed to choose between touches and visual impressions and to execute movements. A test of the accuracy and quickness of movement is also made.

This apparatus was obtained for the Museum through Dr. Joseph Jastrow, Professor of Psychology in University of Wisconsin.

There are also in the same room, apparatus for illustrating the law governing the distribution of individuals in a binomial curve, and for the drawing of the outlines of the various parts of the skeleton. In the smaller room adjoining are apparatus for taking the measurements of the body.

On the South Gallery are situated cases containing the collection of crania, skeletons, etc.

Case 1.—(East End of Gallery.) Crania illustrating Systematic Craniology. The skulls illustrate a number of types and the most frequent variations, such as the proportions and forms of the head and of the face; forms of sutures; centers of ossification; and artificial and natural deformations. The artificial deformations of the skull are practiced in many places throughout the world, and may be divided generally into two classes: The one, lengthening the skull; the other, increasing its height and width. The deformations are generally produced by bandages so disposed around the head of the infant as to produce the required modification of form.

Case 2.—Systematic Craniology and Skulls from Europe and Africa, in the order named.

Cases 3 and 4.—Skulls from Oceanica. Attention is specially called to the ornamented skulls, from New Guinea.

Case 5.—Skulls from Oceanica, and of the Eskimo from the northern coast of America and from Greenland.

Panel 1 (wall). Charts illustrating the growth and proportions of the body of the American Indians.

Cases 6, 7 and 8.—Skulls from the northwest coast of America. These are from Indians living on the Pacific Coast, between California and Alaska. Note the artificial deformations of skulls.

Case 9.—Skulls from Vancouver Island and California.

Case 19.—Skulls of the modern Indians east of the Rocky Mountains, from mounds of Florida and the Cliff Dwellings of Colorado.

Cases 11 and 12.—Skulls of mound builders, from Illinois, Wisconsin, Missouri, and Kansas. Many of these skulls show artificial and post-mortem deformations.

Cases 13, 14 and 15.—Skulls from Peru (vicinity of Cuzco, Ancon, Sierra Gorda, Arica). These skulls, like those in Cases 6, 7, and 8, show the effects of artificial deformations.

Panel 3. Photographs of South Sea Islanders.

The next series of cases contain disarticulated skeletons.

Cases 16 to 20.—Skeletons from Vancouver Island, British Columbia.

Cases 21 and 22.—Skeletons of Iroquois Indians.

Cases 23, 24, 25.—Peruvian skeletons.

Panel 5. Life masks of the peoples of the east coast of Asia and of Oceanica.

Case 26.—The Cunningham series of models illustrating the surface of the brain and its correlation with the skull.

Case 27.—Casts of cranial cavities of various animals and races of man.

Cases 28 and 29.—Articulated skeletons of a gorilla, and of individuals of various races.

Cases 30 and 31.—The chemical constituents of the human body.

The collections of this section were brought together under the supervision of Dr. Franz Boas, and in a very large part are still his private property.

SOUTH COURT.

ANTIQUITIES OF CENTRAL AMERICA.

The South Court contains mainly reproductions of Central American antiquities, obtained through the Department of Ethnology of the World's Columbian Exposition. Besides this, there are collections of Désiré Charnay, of the government of Guatemala, and of the Ethnographical Museum of Berlin.

At the North end of the South Court are exhibited four Totem Poles, or Heraldic Columns, from British Columbia and Alaska. The two western ones were presented by Mr. Ed. E. Ayer. The carvings on these columns represent the crests of the owners.

Nos. 1 to 6.—Stelæ from the Ruins of Copan, Honduras.

No. 7.—Altar, Village of Copan, Honduras.

Nos. 8 to 12.—Altars from the Ruins of Copan, Honduras.

No. 13.—Idol from Quirigua, Guatemala.

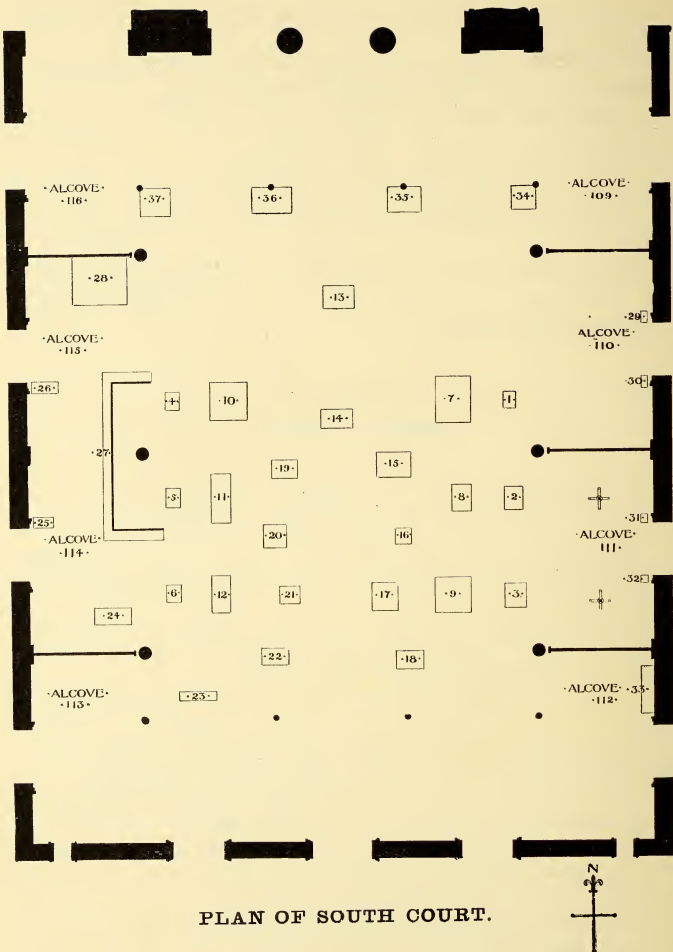
No. 14.—Statue of tlaloc.

No. 15.—Idol from Quirigua, Guatemala.

No. 16.—Stela from Uxmal, Yucatan.

Nos. 17 and 18.—Altars from the Ruins of Copan, Honduras.

Positions of Nos. 15, 16, 17 and 18 changed from plan.



PLAN OF SOUTH COURT.

No. 19.—Large carving from Labna, Yucatan. (Position changed.)

No. 20.—Altar in shape of a monkey. (Position changed).

Nos. 21 and 22.—Altars, Ruins of Copan, Honduras. (Positions changed.)

Nos. 24 to 26.—Stone sculptures from S. Lucia, Cozumalualpa, Guatemala.

No. 27.—Frieze of a grave monument in Yucatan. Over the frieze there are casts of a number of carved doorsteps. A series of photographs of Central American Ruins are exhibited on the inside 27.

No. 28.—Stone sculpture, Ruins of Copan, Honduras. (Position changed.)

Nos. 29 and 30.—Stone sculptures from S. Lucia, Cozumalualpa, Guatemala.

Nos. 31 and 32.—Stone sculptures from Mexico.

The eastern alcoves contain the Charnay collection of reliefs from Mexico and Yucatan.

ALCOVE 112.—Gate-way from Chichenitza. Carvings in wood and stone from the same place.

ALCOVE 111.—Reliefs from Chichenitza and from Palenque.

On the North side, relief from the Tennis Court, Chichenitza. A portion of the painting of this relief has been restored under the direction of Mr. Charnay.

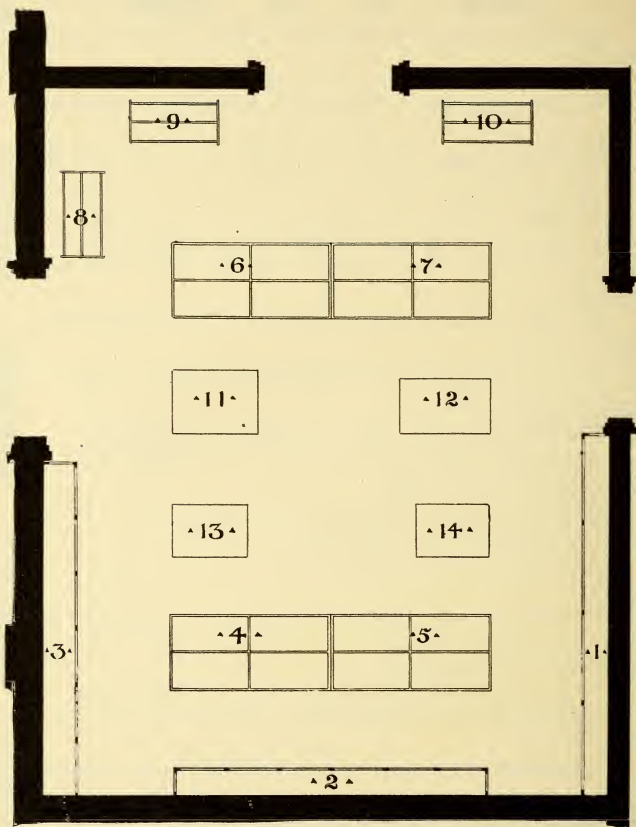
In the alcove photographs of Central American Ruins.

ALCOVES 110 and 109.—Reliefs from Chichenitza and Palenque.

ALCOVE 113 and South Wall of 114.—Reliefs from Santa Lucia de Cozumalhuapa—originals in Berlin.

West Wall of ALCOVE 114.—Reliefs from Honduras.

North Wall of ALCOVE 115 and ALCOVE 116.—Reliefs from Sastanquiqui, Guatemala.



PLAN OF HALL 10.



HALL 10.

ESKIMO.

Containing mainly the collection of Capt. Miner C. Bruce.

Case 1.—Eskimo from Port Clarence, Alaska, in his kayak.

Cases 2 and 3.—Clothing, weapons, and implements of the Eskimo of Port Clarence, Alaska.

Case 4.—Boxes containing stone implements, dolls, toys, pouches, Port Clarence, Alaska.

Case 5.—Masks, basketry, boxes, pouches from Port Clarence, Alaska.

Case 6.—Pictographs, pipes, weapons, and implements, Port Clarence, Alaska.

Case 7.—Axes and picks made of jade, stone implements, carving knives, traps, Port Clarence, Alaska.

Case 8.—Sleds from North Greenland.

Case 9.—Sleds from Port Clarence, Alaska.

Case 10.—Sleds from the Yukon River.

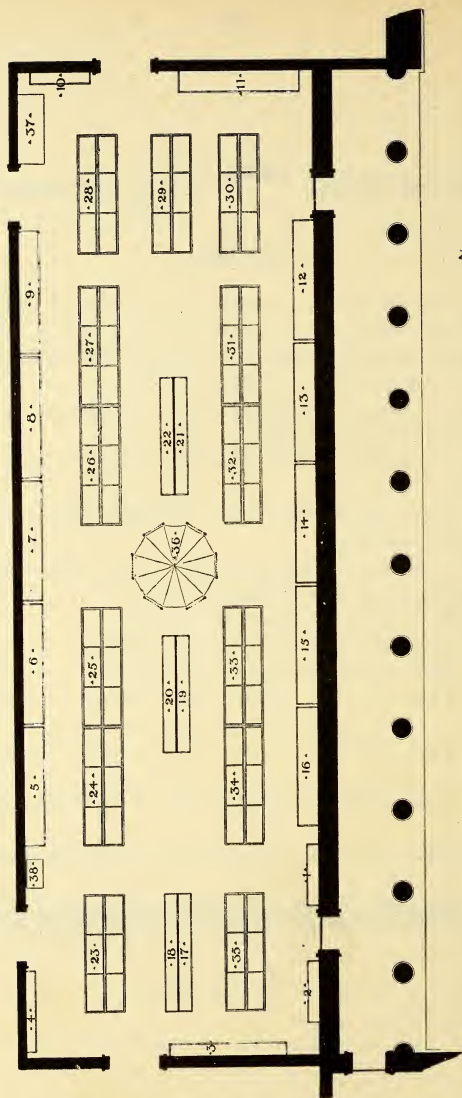
Case 11.—Model of a house of the Eskimo of East Greenland.

Case 12.—Model of a snow house of the Eskimo of Baffin Land.

Case 13.—Model of summer tent of the Eskimo of Baffin Land.

Case 14.—Model of a stone house of the Eskimo of Baffin Land.

Positions of several cases changed from plan.



PLAN OF HALL 18.

HALL 18--AYER HALL.

THE PRIMITIVE TRIBES OF NORTH AMERICA.

The specimens exhibited in this Hall include mainly the collection of Mr. Ed. E. Ayer, which covers the whole continent of North America; the collection of Lieut. R. Peary, from North Greenland; Rev. Sheldon Jackson, Rev. E. Cherry, and Governor Swineford, from Alaska; Dr. Robert Bell, from Hudson Bay; Mr. Isaac Cowie, from Saskatchewan; Rev. E. F. Wilson, from Manitoba; Mr. Henry Hales, from New Mexico; Dr. C. Lumholtz, from Northern Mexico.

Case 1.—Weapons and implements of the Eskimo of North Greenland. Suits of clothing from North Greenland.

Case 2.—Suits of clothing from North Greenland.

Case 35.—Tools, implements, toys, bows and arrows, from North Greenland.

Over Case 3.—Two canoes from North Greenland are suspended.

Case 17.—Clothing of the Eskimo of the East Coast of Hudson Bay. Suit of clothing of a child from Greenland.

Cases 3 and 4.—Clothing and weapons of Alaskan Eskimos.

Case 18.—Carved dishes and spoons from Alaska and Northern British Columbia. Wooden helmets and dancing hats and dish made of the vertebra of the whale from Alaska, baskets of the Indian Tribes of Alaska and British Columbia.

Case 23.—Tools and implements of Alaskan Eskimo. Pictographs engraved on ivory. Dancing masks. Carved spoons made of the horns of mountain goat and of the big horn sheep, the handles being carved with representations of the crests of the owners. Daggers; painted bags for red paint; charms and rattles of the Medicine Man; gambling sticks; and rattles used in society dances.

Case 24.—Carved spoons of horn of the Rocky mountain goat and big horn sheep. Carved dishes; models of boats; masks; halibut hooks.

Case 34.—Basketry from the Northern Pacific Coast.

Over Cases 12 to 16, 1 and 2.—A series of Alaskan kayaks and baidarkas are suspended.

Case 5.—Clothing and bows and arrows, models of houses and canoes, baskets of the Athapascan tribes of Alaska. Suits of

clothing, bows and arrows, weapons, pouches, saddle-bags, snow shoes, and medicines of the Cree Indians.

Over Cases 5 and 6.—Athapascan canoes are suspended.

Case 6.—Painted robes, cradle, head ornaments, saddle, drums of the Cree Indians.

Case 20.—Clothing, baskets, and implements of the Chippewa and Ottawa Indians. Model of a hut, stone implements, loom of the Micmacs. Snow shoes, bows and arrows of the Montagnais Indians. Stone implements of the Iroquois. Cherokee baskets.

Case 25.—Bead work, pipes, moccasins, ornaments, clubs of tribes of the Missouri River Valley.

Cases 7, 8, and 22.—Clothing ornamented with beads, saddles, quivers of the Sioux Indians.

Over Cases 7 and 8.—Ojibwa canoes are suspended.

Case 9.—Clothing, ornaments, weapons of the Ute and Comanche.

Over Case 9.—A Cree canoe and a round Mandan canoe are suspended.

Case 26.—Dolls, toys, pipes, moccasins, bead work of the Sioux Indians.

Case 27.—Clothing, implements of Arapahoes, Cheyenne, Pawnee, Nez Percés.

No. 37.—Model of a Winnebago and of a Chippewa Lodge.

Case 28.—Modern Indian industries.

Case 29.—Cherokee and Catawba pottery, blow pipe, turtle shell rattles, bow and arrows, baskets. Mandan pottery.

Case 10.—Moqui and Zuni basketry, dress, drum.

Case 11.—Moqui pottery.

Case 12.—Moqui pottery. Pottery from New Mexico.

Case 30.—Stone implements from California.

Case 13.—Basketry from Southern California.

Case 14.—Apache basketry.

Case 31.—Clothing, ornaments, weapons from California.

Case 32.—Navajo blankets and loom.

Case 21.—Navajo blankets.

Case 15.—Yuma and Pima basketry.

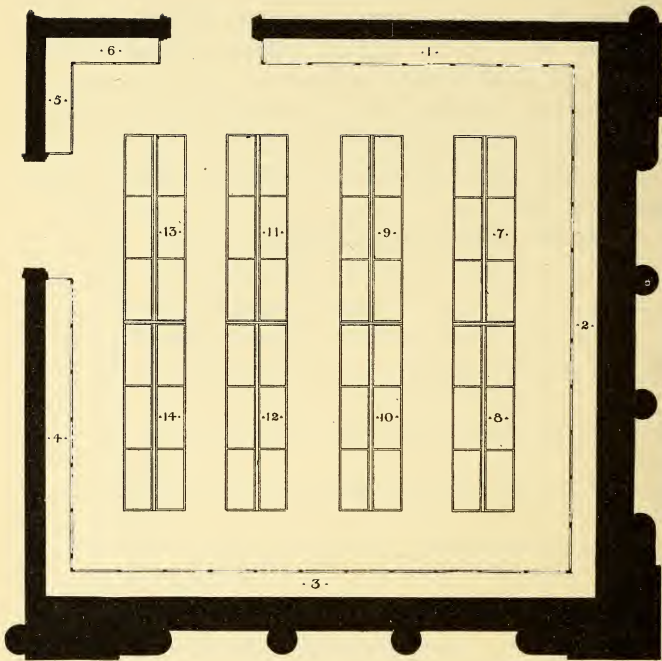
Case 33.—Apache clothing, ornaments, weapons.

Case 16.—Apache clothing, weapons. Navajo clothing, saddle-bag, ornaments, weapons.

Case 19.—Blankets, belts, weapons, pottery, stone implements from the Sierra Madre.

No. 36.—Cree tepee; lazy seat inside; dog travois leaning against the side.

Case 38.—Indian silver ornaments.



PLAN OF HALL 17.



HALL 17.

PARAGUAY.

This hall contains the collections of Dr. E. Hassler. The tribes represented in the collection inhabit the Gran Chaco. The most northern tribes inhabit Brazilian territory, while the more southern ones live in Argentine Republic. The principal tribes represented are the Tobas, Lenguas, Chamacoccos, Guaranis, Cuximosso, Panas, Paitas, and Omiris. The collection is remarkable because it represents tribes which have had hardly any contact with civilization. The collection contains a vast amount of beautiful feather work, and a number of most interesting stone weapons. Case 13 contains a collection made by Lieutenant D. U. Bertollette.

Case 1.—Feather ornaments; particularly head ornaments and necklaces, pottery, feather wands.

Case 2.—Feather belts, wands, feather ornaments, rattles, necklaces, ropes, bags.

Case 3.—Feather wands, bags, hammocks, nets, ropes, bows.

Case 4.—Bows; in the upper part of the case, bows with double bow-strings for shooting balls; spades for digging roots; paddles; wooden lances; arrows for war and hunting; stone axes ornamented with feathers; wooden clubs; fish-trap, which is let down over the fish, the latter being taken out from underneath by the fisherman.

Case 5.—Hammocks; arrows.

Case 6.—Bows and arrows; feather wands; head ornaments; ornamented gourds; pottery.

Case 7.—Feather ornaments.

Case 8.—Necklaces of bones; rattles; fans; hats; stone axes; ornaments made of shells and of fruits; rattles made of turtle shells.

Case 9.—Feather ornaments.

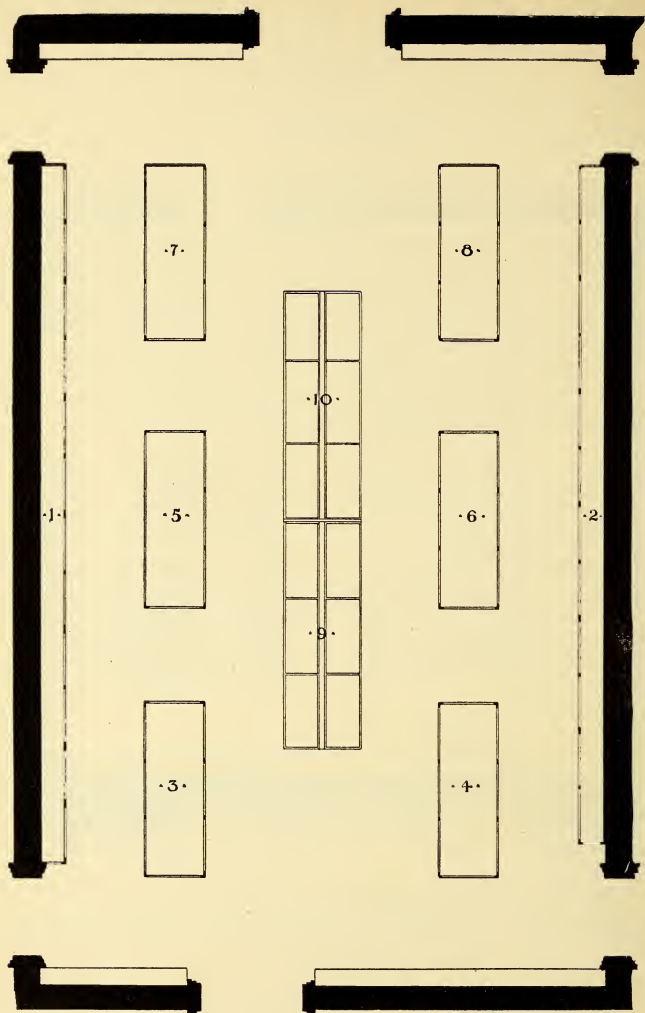
Case 10.—Ornaments of shells; fire drill; gourds; amulets; spindles; flutes; pipes; combs; necklaces.

Case 11.—Feather ornaments.

Case 12.—Necklaces; rattles.

Case 13.—Bows and arrows; bags; lances; feather ornaments.

Case 14.—Feather ornaments.



PLAN OF HALL 16.



HALL 16.

SOUTH AMERICA.

This hall contains mainly collections from the Atlantic watershed of South America, and from the West Indies. The principal collections are those of Messrs. J. J. Quelch, Mr. Roger Welles, F. A. Ober, and Lieutenant Safford.

Case 1.—Beginning at the southern end of this case: Bottom shelves: Pottery from Curacao. First shelf: Stone implements from the West Indies. The upper part of the case contains modern pottery and utensils from Puerto Rico. Farther northward, a collection from the Salamanca Indians, Costa Rica: lances, arrows, nets, paddles, bags, and hammocks. North of this there is a collection illustrating the clothing, the weaving industry, and some miscellaneous objects from the United States of Colombia. The northernmost portion of the case contains specimens from British Guiana: A mortar; head ornaments; a wrestling shield; cassava grater.

Case 7.—British Guiana: Hammocks; strainers; winnowing baskets; material for basketry; baskets.

Case 8.—British Guiana: Pottery; gourds; head ornaments.

Case 10.—The northern part contains models of canoes, and vegetable products from British Guiana.

Case 5.—Venezuela: Hammocks, lances, bows and arrows, blow guns, and poisoned arrows; cassava grater; torch; bark cloth.

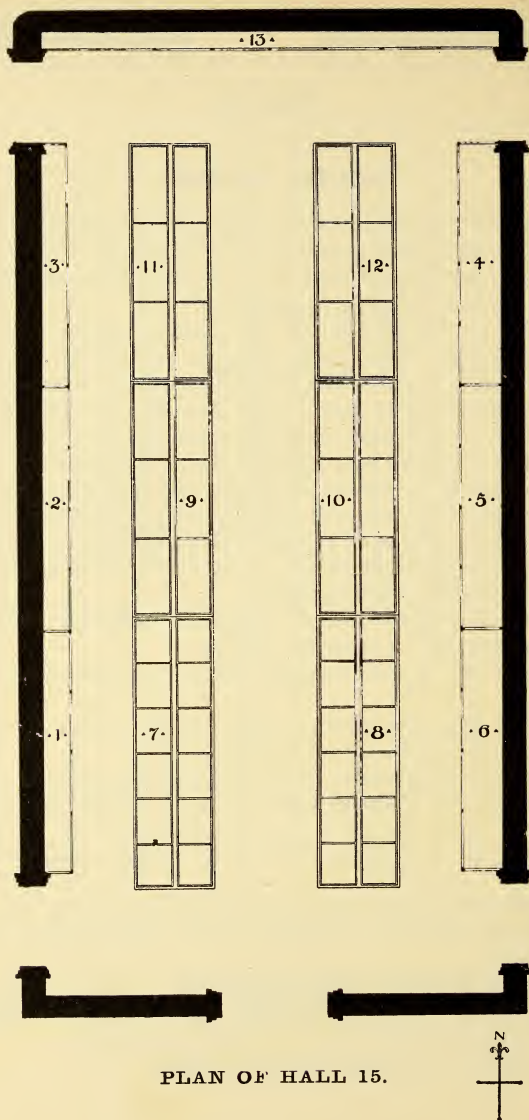
Case 6.—Venezuela: Hammock; arrows; basketry; pottery.

Case 10.—The southern part of Case 10 contains bows from Venezuela; ornaments; poisoned arrows; small graters; paints; flute; twine.

Cases 3 and 4.—Brazilian basketry.

Case 9.—Ornamented gourds, ropes, dolls, bark clothing, bows and arrows, and feather ornaments from Brazil.

Case 2.—Costumes of Bolivian Indians.



PLAN OF HALL 15.

HALL 15.

PERU AND COLOMBIA.

This hall contains part of the collection of Mr. G. A. Dorsey, the collective exhibit of the United States of Colombia at the World's Columbian Exposition, and the Montes collection.

Cases 1 to 3.—Pottery and stone implements from the United States of Colombia.

Case 4.—Pottery from Cuzco, Peru. A number of remarkably large vases are exhibited on the bottom of the shelf. The central part of the bottom of the case is occupied by small reproductions in stone of architectural works.

Case 5.—Pottery and inlaid wood work from Cuzco, Peru.

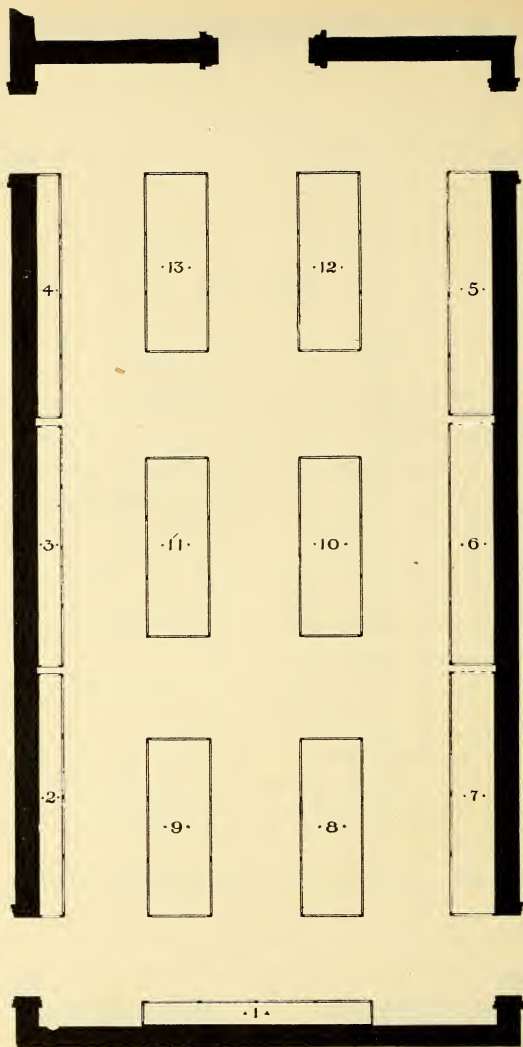
Case 6.—Pottery from Cuzco, Peru.

Cases 7, 8, and 9.—Contents of graves from Ancon, Peru.

Case 11.—Contents of graves from Iquique, Chili.

Cases 10 and 12.—Stone carvings and pottery from Cuzco, Peru.

Case 13.—Gold ornaments from Colombia and Peru.



PLAN OF HALL 14.



HALL 14.

PERU.

This hall contains collections made by Mr. G. A. Dorsey, and Lieutenant Safford. It is entirely devoted to Peruvian antiquities, most of the material being the result of excavations made in ancient graveyards of various parts of Peru and exhibiting the culture of the Pre-Columbian Peruvians.

Case 1.—Contains select pieces found in graves of Ancon and in other parts of Peru. The pieces contained in this case are especially well preserved. The case contains principally ponchos, bags, feather work, copper ornaments, and a few stone implements.

Case 2.—Pottery found in Chancai. In comparing the contents of this and the following cases it will be noticed that each locality has its peculiar characteristic type of pottery.

Case 3.—Pottery found in Sierra Gorda. This pottery resembles very much the pieces found in Ancon. The two top shelves of the case contain specimens from Chimbote.

Case 4.—Pottery from Chimbote. Stone carvings and pottery from Ecuador take up the bottom shelf.

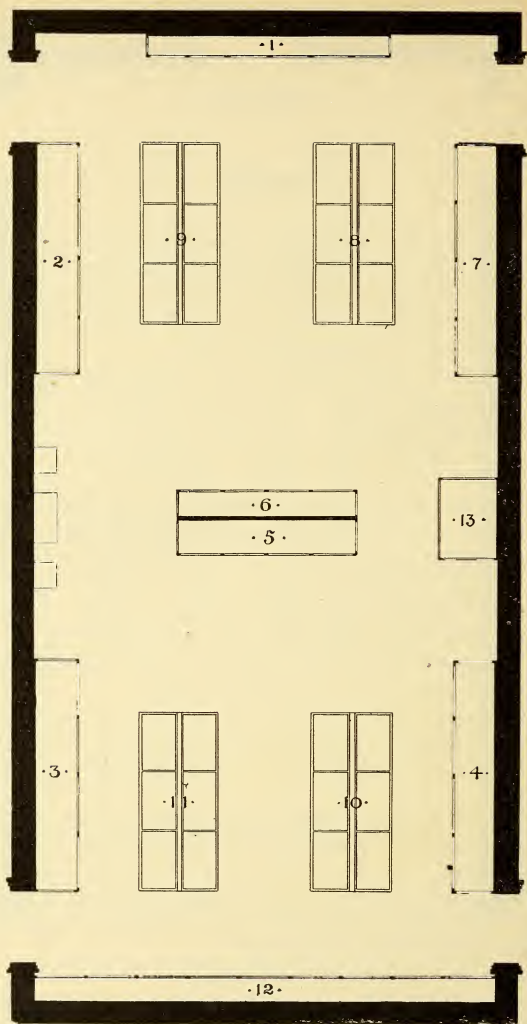
Case 5.—Mummies found in graves at Ancon. On the shelves of the case some smaller mummies are exhibited which were found in the same graves in which the larger mummies were found.

Cases 6 and 7.—Mummies found in graves at Ancon. On the shelves there are pottery and clothing found on the surface of the graveyard.

Case 8.—Contents of a grave from Chancai. The mummy and the surrounding pottery are kept as nearly as possible in the position in which they were found.

Case 9.—Mummies from Cuzco.

Cases 10 to 13.—Graves from Ancon. These graves were at a depth from six to ten feet. The contents of the graves have been kept in the same arrangement in which they were found.



PLAN OF HALL 13.

HALL 13.

NORTH PACIFIC COAST AND ANTIQUITIES FROM CENTRAL AMERICA.

Case 1.—Collection of masks, rattles, and ornaments belonging to ceremonial dances of the Indians of British Columbia.

Case 2.—Masks belonging to the ceremonial dances of the Bella Coola Indians. The center of the case is taken up by a mask representing a winged dog, the fabulous ancestor of one of the tribes in the interior of the country.

Cases 3, 4, and 5.—Masks and dancing ornaments of the Kwakiutl Indians of Vancouver Island. Boxes, ropes, and dishes.

Case 6.—Fishing implements and clothing of the Kwakiutl Indians.

Case 13.—Cannibal dancer; Kwakiutl Indians.

Case 7.—Utensils, masks, basketry from the west coast of Vancouver Island, from Puget Sound, and Shoalwater Bay. Wood carving representing the guardian spirit of a medicine-man of the Chinook Indians. Models of types of canoes used by the Indians of the State of Washington. Cradle of the Chinook Indians.

Case 8.—Ornaments, dishes, spoons, and snow shoes of the Indians of Puget Sound. Stone implements from the interior of British Columbia.

Case 9.—Stone implements of the Bella Coola Indians; bows and arrows; spindles, dishes, and ornaments of the various tribes of British Columbia.

Case 10.—Kwakiutl Indians: Food products, household utensils, models of house posts, and gambling implements.

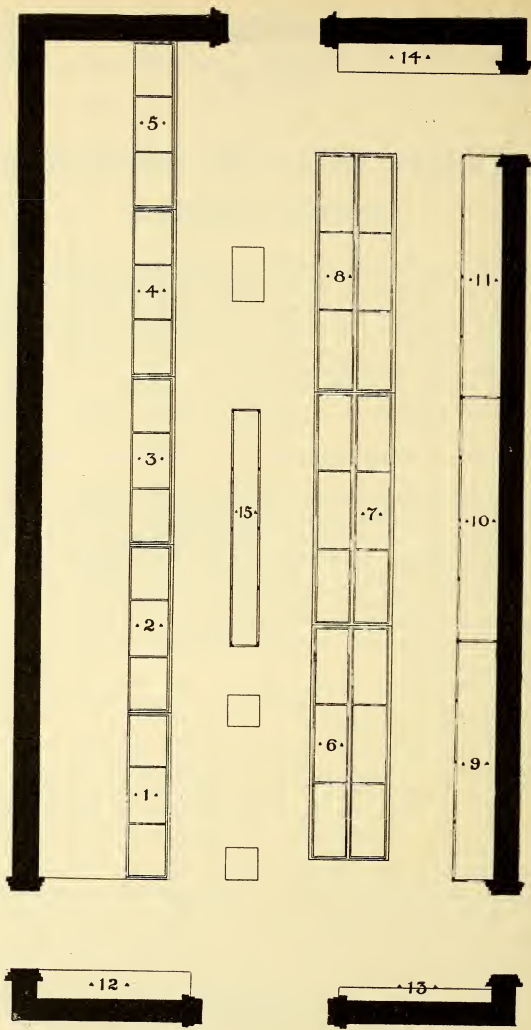
Case 11.—Kwakiutl Indians: Battle axes, pile drivers, rattle, dancing implements; various forms of money, such as pieces of copper tied together by fours and brass bracelets fastened to sticks.

On the North Wall.—Large carving representing the fabulous double-headed snake. This is used in a ceremonial festival, in which the carving is seen to rise from under the ground.

On the South Wall.—The carving over the case represents the same fabulous being, and is used in the same manner.

The painted boards on the East and West walls represent crests of a clan of the Kwakiutl Indians. One of these door-ways is placed in the front of the house, the other in the rear of the house, as shown in the house front in Alcove 93.

Case 12.—Pottery from Cos'a Rica. Antiquities from Mexico.



PLAN OF HALL 12.



HALL 12.

NORTH PACIFIC COAST.

This hall contains a portion of the collection of Mr. Ed. E. Ayer, Gov. Swineford, and a number of collections made under the direction of Prof. F. W. Putnam.

On the West Side of the hall is a model of a portion of the village of Skidegate, arranged on a platform. This model presents the characteristic features of the villages of the Haida Indians who inhabit Queen Charlotte Islands, British Columbia. The carved columns in front of the houses represent the crests of the house owners. The large isolated columns in front of the house are erected in memory of deceased relatives or friends. The posts having a large carved board attached to their tops are graves, the bodies being deposited behind the carved board on the top of the column.

Implements of the Indians of Alaska and Northern British Columbia are exhibited in the cases in front of the model of the village.

Cases 1 and 2.—Tools and implements of the Alaskan Eskimo, including adzes, axes, fish hooks, knives, awls, and pipes.

Case 3.—Masks, boxes, and musical instruments of the Alaskan Eskimo. Implements used by the secret societies of the northern tribes of British Columbia.

Cases 4 and 5.—Implements used by the secret societies of the northern tribes of British Columbia, particularly whistles which imitate the sounds of spirits, and head ornaments made of red cedar bark.

Case 15.—Woven blankets made of mountain goat wool on a warp of cedar bark, made in Chilcat, Alaska. Painted skin blanket.

Case 9.—Weapons and clothing, baskets and fishing implements, of the Alaskan Eskimo.

Case 6.—Bows, arrows, throwing sticks, fish-hooks, fish weirs, and drills of the Alaskan Eskimo.

Case 10.—The southern portion of the case contains a collection from Queen Charlotte Islands. The northern portion of the case contains specimens collected among the Tsimshian Indians of northern British Columbia; a series of head dresses used in ceremonial dances; masks, coats and dancing aprons used for the same purpose; a large copper plate used as money; armor made of elk skin; masks, baskets, stone implements, and fishing implements of the Tsimshian Indians.

Case 7.—Basketry, model sleds and canoes, fastenings for dog harness and snow goggles of the Alaskan Eskimo.

Case 11.—Masks used in the ceremonies of the secret societies of the Bella Coola Indians of British Columbia. Stone mortars and dishes.

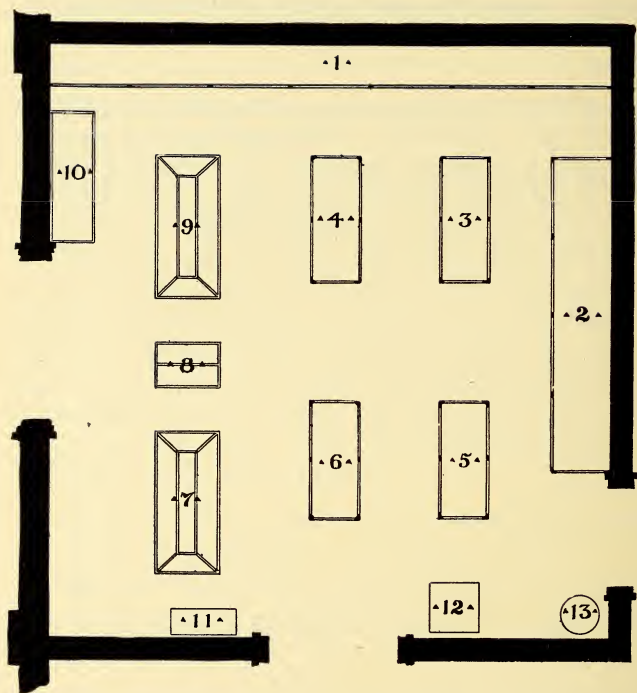
Case 8.—Dish, axes, loom and spindle of the Tsimshian Indians. Ornaments of red cedar bark used by the secret societies of the Bella Coola Indians. Stone implements of the Bella Coola Indians.

East and North Walls.—A number of figures are exhibited which were taken from the houses of the Bella Coola Indians.

On the platform on the North wall is a model of a carved Haida house, and of a chief's grave; the latter is in the form of a house, the coffins being placed inside.

On the South Wall there are a series of models of Heraldic Columns from various parts of the North Pacific Coast. On a platform there are three models of houses of the Bella Coola Indians.

Beginning at the South portion of the middle aisle there is a carved figure representing a chief's speaker, from Vancouver Island; a grave monument, from Bella Coola, representing a grizzly bear and another one representing an eagle. On top of the wall cases on the East wall are two painted drums.



PLAN OF HALL 11.

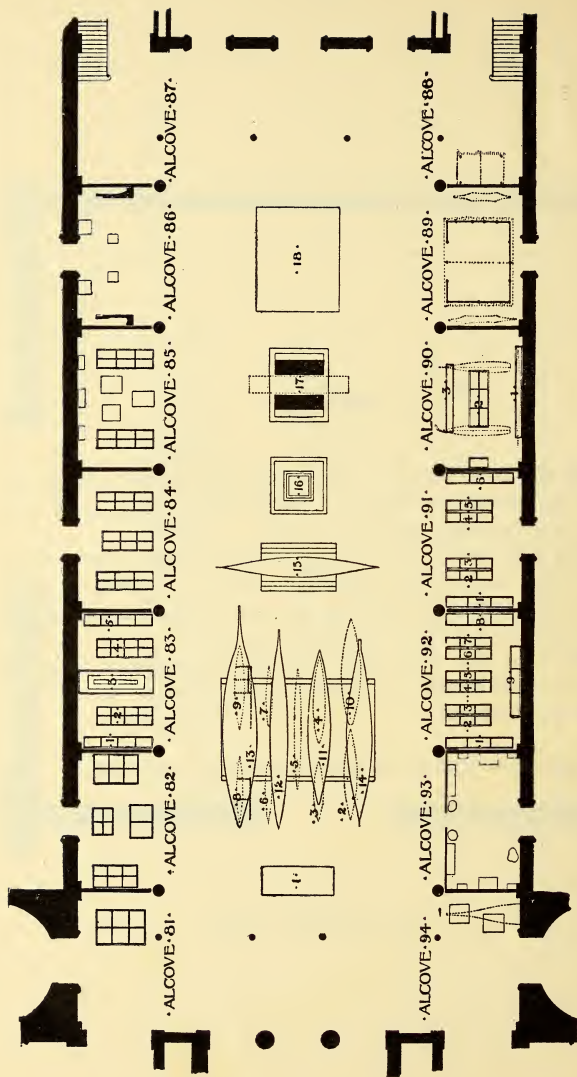
HALL 11.

Case 1.—A collection of the old Spanish Church vestments. Collected at Pueblo, New Mexico. In the bottom of the shelf is a portion of the Gunning collection of idols.

Cases 2 to 6.—The Gunning collection of idols. The collection illustrates mainly the Buddhistic religions of Asia. It embraces, also, specimens illustrating religions of the ancient Mexicans, Peruvians, and of many primitive people.

Cases 7 to 10.—Collection of reproductions of Irish antiquities, such as crosiers, shrines, fibulæ, head ornaments. Loaned by Mr. Edmond Johnson.

Positions of several cases slightly changed from plan.



PLAN OF EAST COURT.

ALCOVES OF EAST COURT.

ALCOVE 94.—Canoe of the Haida Indians.

ALCOVE 93.—The front of a house of the Kwakiutl Indians, from Vancouver Island is placed in front of the alcove forming the entrance to the collection from the North Pacific coast. The painting on the house front represents the crests of the clan of the owner; in the middle, the thunder bird. On each side, the moon; a carved post stands to the left and right of the door. The principal figures on the posts represent personages connected with the myth of the clan. The lower figures represent fabulous beings; the small heads on the south posts represent slaves which were given in payment for these carvings. On each side of the posts is one bed-room painted with the crest of the person occupying the room.

South Wall.—A large post which stood in the rear of the Indian house. A heavy beam connected the rear post with the two front posts. Eastern part of south wall: A model of a house from the West Coast of Vancouver Island.

West Wall.—In the middle, a heraldic column forming the entrance to a house of the Bella Coola Indians; on each side, posts from the interior of houses from Bella Coola.

East Wall.—In the center is a heraldic column from Bella Coola representing a grizzly bear; on each side, house posts from Nanaimo, B. C. The northern one representing a man holding a goose; the southern one representing the fabulous Xoaexoe.

ALCOVE 92.—On the walls reproductions of Mexican feather shields.

Case 1.—Clothing and implements from the grave yard at Ancon, Peru.

Cases 2 to 9.—Contents of graves from Ancon, Peru.

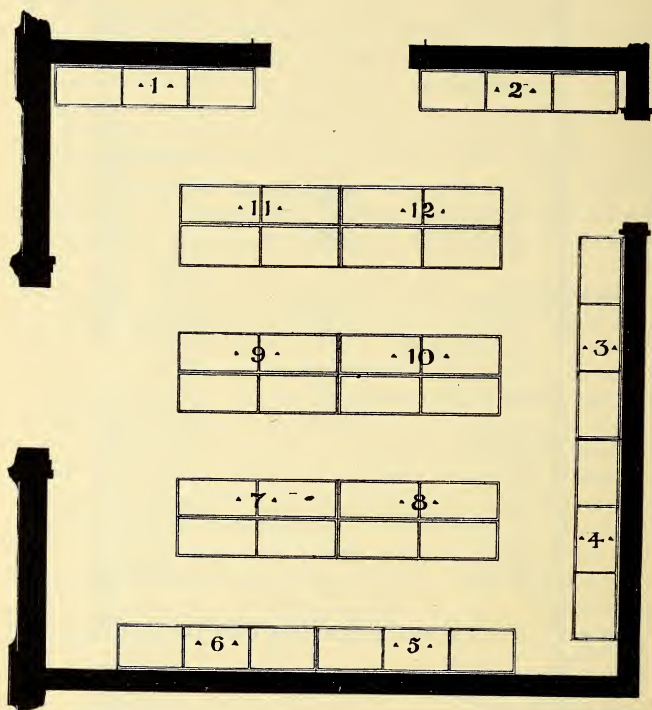
ALCOVE 91.

Case 1.—Contents of graves from Arica, Peru, showing artificially elongated skulls.

Cases 2, 3, and 4.—Pottery, stone and metal implements found at La Plata, Ecuador. Large ceremonial stone axe.

Case 5.—Contents of graves from Ancon, Peru.

Case 6.—Contents of graves from Iquique, Chili.



PLAN OF HALL 2.



ALCOVE 90.

Case 1. Costumes of the halfblood Indians of Bolivia.

Cases 2 and 3.—Ornaments and implements of the Indians of the upper Amazon. Desiccated head, prepared by the Javiros Indians. Peruvian boats, made of rushes. Canoe from British Guiana.

ALCOVE 89.—Brazilian hut, forming the entrance to the South America collections. In the hut, wooden cooking vessels and a sugar cane press from British Guiana are found. Brazilian baskets and fishing nets are placed in the hut.

ALCOVE 81.—Deposit of flint disks found in the Hopewell group of mounds, Ohio.

ALCOVE 82.—Model of the Serpent Mound, Ohio. Model of Turner Group of Mounds, Ohio. Model of Fort Hill, Ohio. Model of Clarke's Works, Ohio.

ALCOVE 83.—Antiquities from St. Nicholas Island, Southern California.

Case 1.—Pestles.

Case 2.—Pestles, mortars, and perforated stones.

Case 3.—Large stone mortars, grinding stones.

Case 4.—Perforated stones, mortars, axes, and bone implements.

Case 5.—Implements made of bone and shell. Pottery.

ALCOVE 84.—Colorado. Mummies, pottery, and basketry work of the Cliff Dwellers of Colorado. Sandals, ropes, woven material.

ALCOVE 85.—Models Cliff Dwellings and Pueblos. Antiquities from the Cliff Dwellings.

ALCOVE 86.—Re-productions of Assyrian antiquities: Winged Bull, Winged Lion, and Obelisk of Shalmanesar. Two figures of giants at entrance to Hall 7.

HALL 2.**ARCHÆOLOGY OF DELAWARE.**

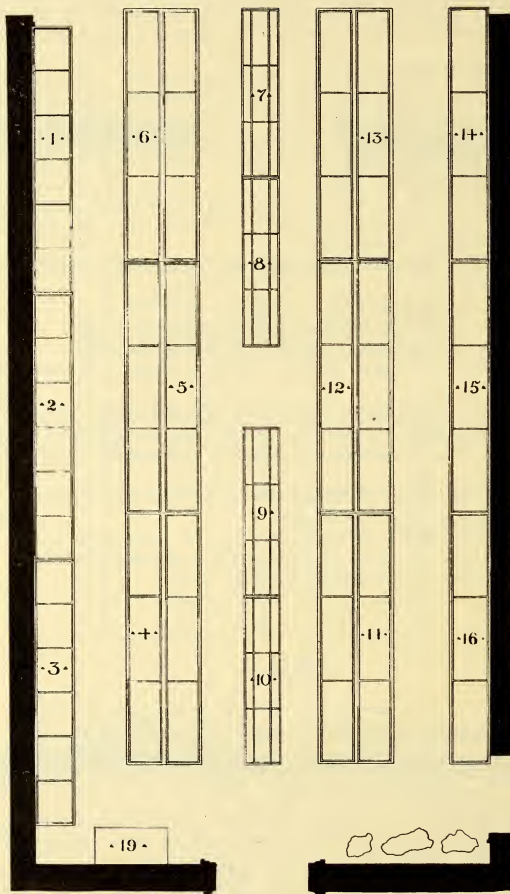
This hall contains collections made by Mr. E. Volk, principally in the neighborhood of Trenton, N. J.

Cases 1 and 2.—Finds made on Lalor Field, Trenton, N. J.

Cases 3, 4, 5, and 6.—Finds made at a village site at Pocatquissings Creek, N. J.

Cases 7 and 8.—Finds from Wright's field, Trenton, N. J.

Cases 8, 9, 10, 11, and 12.—Finds from the Argillite Workshop at Point Pleasant, on the Delaware River twenty-five miles north of Trenton, N. J.



PLAN OF HALL 3.



HALL 3.

ARCHÆOLOGY.

This hall contains collections made by Mr. Ed. E. Ayer, Mr. James Knowlton, Mr. E. Volk, Mr. Warren K. Moorhead, Mr. H. H. Hayssen, and Messrs. Wyman Brothers.

Case 6.—Finds from Pocatuissings Creek, N. J., collected by E. Volk.

Case 18.—Stone implements from various parts of North America.

Case 1.—Specimens found in shell heaps of Maine, collected by James Knowlton.

Case 2.—Finds from the Taylor mounds near Oregonia, Ohio.

Case 3.—Finds from the Hopewell group of mounds, collected by Warren K. Moorhead. Specimens found in the Effigy mound. Copper head dress in the shape of a pair of antlers. A large copper celt.

Case 5.—Finds from the Hopewell group of mounds. Shells, large stone dish, copper axe

Case 4.—Finds from Ft. Ancient, Ohio Collection by Warren K. Moorhead.

Case 19.—Copper implements from Wisconsin, collected by H. H. Hayssen.

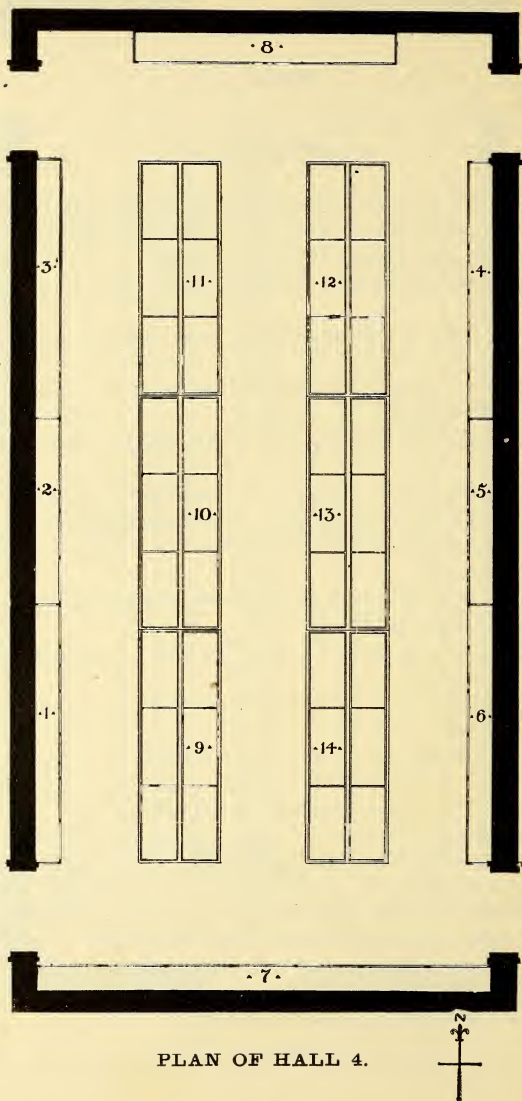
Cases 7 to 10.—Stone implements from Wisconsin, collected by H. H. Hayssen.

Case 17.—Stone implements from Maryland. Copper implements from Wisconsin

Cases 13, 14, 15, and 16.—Stone implements and pottery from Wisconsin. Collected by H. H. Hayssen.

Cases 11 and 12.—Wyman collection of stone implements and copper implements from Wisconsin. Large stone axes. Copper spears, copper celts, lance heads.

Case 20.—Large boulders showing smooth surfaces which were used for grinding stone implements.



PLAN OF HALL 4.

HALL 4.

OCEANICA.

This hall contains the Finsch collection, the Peace collection, and portions of the Hagenbeck collection.

Case 1.—Lances, bows and arrows, shields, drums, from New Guinea.

Case 2.—Lances, paddles, masks, and wood carvings, from New Britain and New Ireland.

Case 3.—Model of a house, masks, lances, grass cloth, from New Caledonia.

Case 8.—Idols and mummy, from the New Hebrides. Image, from New Caledonia. Large dishes, from Samoa.

Case 4.—Models of houses, pottery, basketry, models of boats, New Caledonia.

Case 5.—Lances, shields, paddles, scepters, grass cloth, New Hebrides.

Case 6.—Lances, bows and arrows, clubs, grass cloth, New Hebrides. Masks and ornaments, Solomon Islands.

Case 7.—Carvings, lances, bows and arrows, paddles, clubs, cloth, Solomon Islands. Tapa, lances, bows and arrows, from various parts of the Pacific Ocean. Armor, from the Gilbert Islands.

Case 9.—Arrows, ornaments, masks, combs, stone implements, from New Guinea.

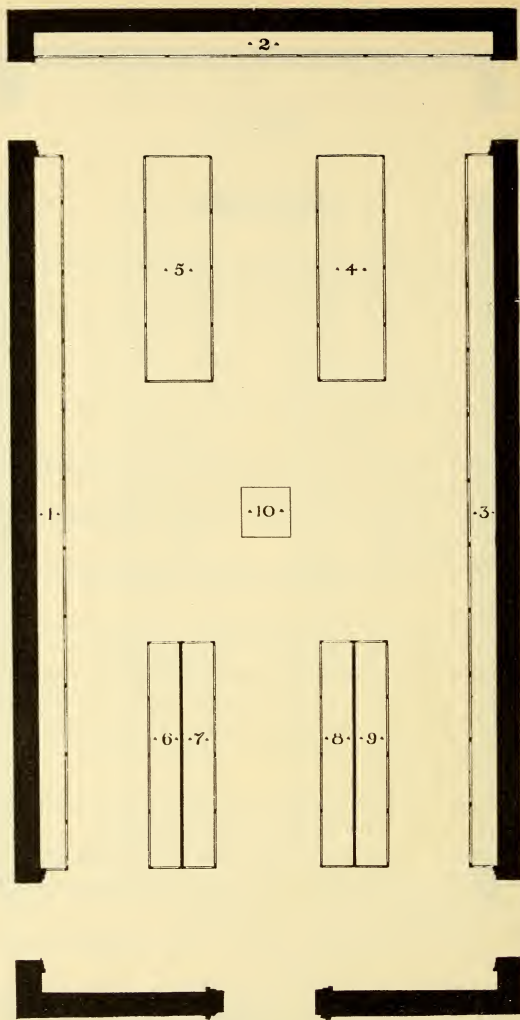
Case 10.—Amulets, stone implements, musical instruments, combs, flutes, clubs, New Britain and New Ireland.

Case 11.—Clubs, large jade axes, New Caledonia.

Case 12.—Ornaments, bead work, boar's tusks, masks, New Hebrides. Implements from Micronesia.

Case 13.—Ornaments, ropes, water vessels, clubs, fans, from Micronesia and Polynesia.

Case 14.—Lances, Admiralty Islands. Club and stone implements, from New Zealand. Lances, shields, and boomerangs, from Australia.



PLAN OF HALL 5.



HALL 5.

ASIA.

Case 1.—Siberia. In the southern end of the case, a collection of costumes, baskets, and fishing implements of the Aino of Saghalin. Costumes and baskets of Golds and Ghilyaks. Costumes of Tungus and Orochones.

Case 2.—Japanese embroidery, masks, priest's suit, armor. Corean soldier's costume. Javanese theatrical costumes, bows and arrows, quivers, Malay shields and lances.

Case 3.—Javanese theatre, set of masks, costumes, head dresses, and marionettes.

Cases 4 and 5.—Containing a set of musical instruments composing a Javanese orchestra.

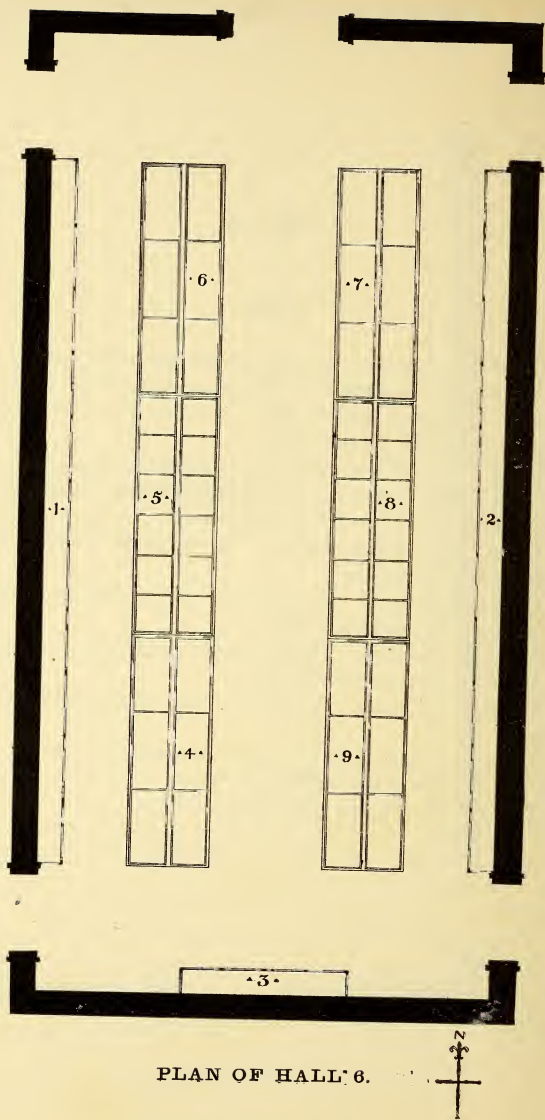
Case 6.—Ceylon: Drums, masks representing demons.

Case 7.—Singalese costumes.

Case 8.—Ceylon: Vegetable fiber, marionettes, models of vehicles.

Case 9.—East India musical instruments, brass work, pottery, and baskets of the Vedda of Ceylon.

Case 10.—Pagoda from Japan



PLAN OF HALL 6.

HALL 6.

This hall contains the Remenyi collection, part of the Hagenbeck collection, and the collections of Messrs. Lingle and Davenport.

Case 2.—Beginning at the North end: Lances, cross-bows, throwing knives, Gaboon. Grass cloth, fetishes, lances, drums, from the Congo basin. Shields, lances, dishes, milk pots of the Zulu.

Case 3.—Lances, shields, and cloth of the Zulu. Paddles and model of a canoe, from Cameroon.

Case 1.—Fetishes, clothing, fans, weapons, ornaments, from Dahomey. Shields, hats, saddles, drums, basketry, from Nubia.

Case 9.—Bracelets, necklaces, snuff boxes, pipes, and rattles of the Zulu.

Case 8.—Canes, neck rests, dishes, spoons, bead work of the Zulu.

Case 7.—Southern part: Musical instruments, fetishes, bows and arrows, swords, knives, from the Congo basin.

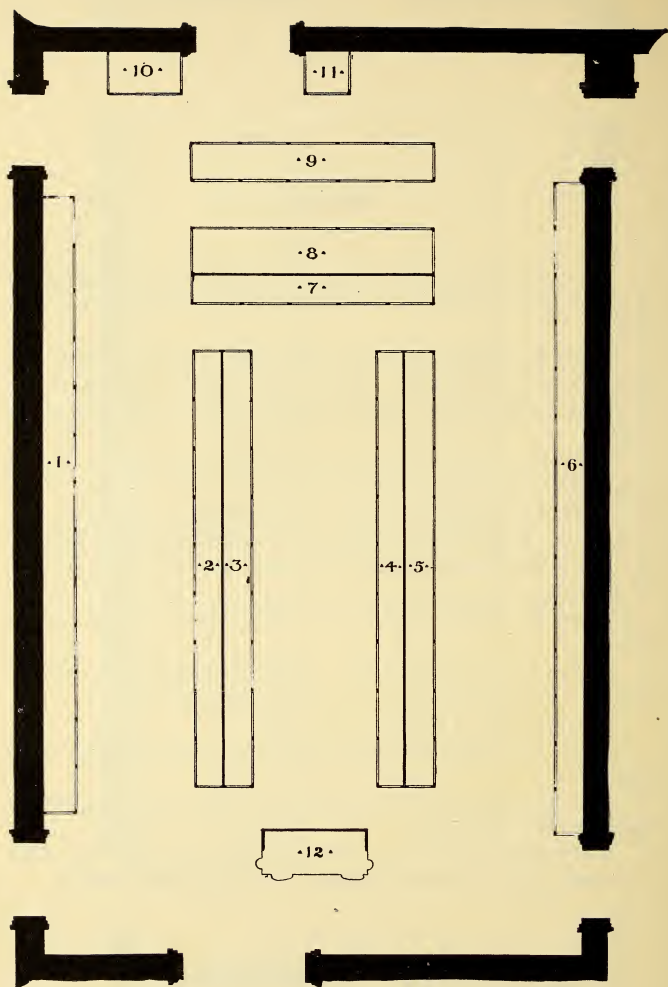
Northern part: Daggers from Java.

Case 4.—Canes and ornaments of the Zulu, fetishes, clubs, and axes.

The Northern part of the case contains ropes, pouches, musical instruments, from Nubia.

Case 5.—Lances, swords, hats, sandals, basketry, from Nubia

Case 6.—Swords and daggers, from Java and Celebes.



PLAN OF HALL 7.



HALL 7.

CHINESE RELIGIONS AND LIFE.

Cases 1 and 6.—The Buddhistic Pantheon, and the Ten Courts of Justice.

Cases 3 and 4.—Six scenes, illustrating myths of China.

Cases 2 and 5.—Costumes of China.

Case 7.—Shrines of Buddhistic Saints.

Case 9.—Incense Burners.

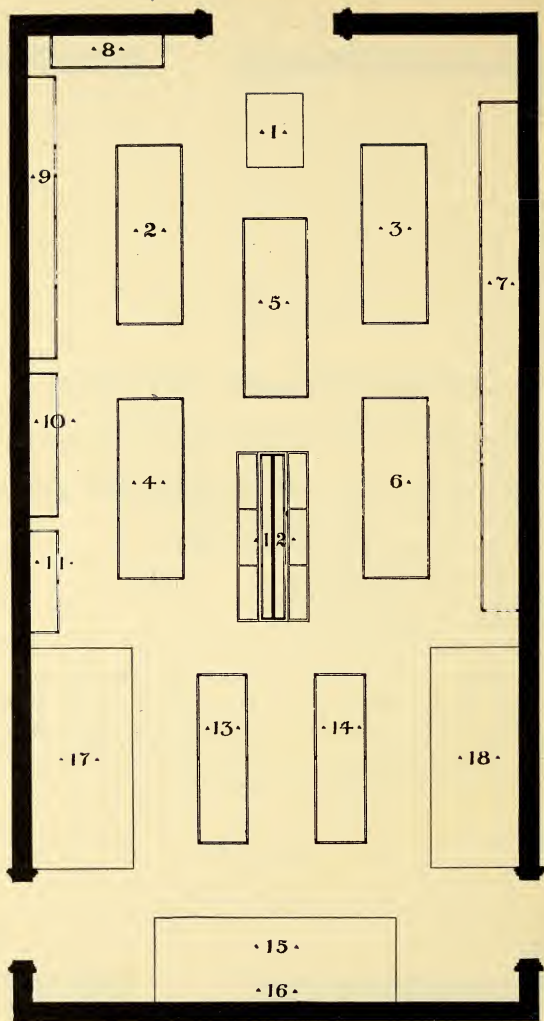
Case 11.—Sleeping Buddha.

Case 10.—Laughing Buddha.

Cases 8 and 9.—Form one shrine.

Case 13.—Representation of the myth of the six kings.

Case 12.—Representation of the myth of a princess marrying a beggar. A giant is placed on each side of the south door of the hall. These figures are placed as door-keepers in temples, and are supposed to keep away evil spirits.



PLAN OF HALL 22.



DEPARTMENT OF INDUSTRIAL ARTS.

Such contributions to the Department of Industrial Arts as are available for Museum purposes have been arranged to show, as far as possible, the more important steps which have led to improvement in handiwork, or progress in the invention of those implements, machines, and processes which have proved to be important factors in the world's material development.

The objects exhibited have, with a few exceptions, been culled and classified from a large mass of contributed material. Owing to the limited space available for the creation of special sections, many gifts to the department have been temporarily placed in storage.

Since intercommunication has had so great an influence upon every department of applied science, and especially upon what may be called the epoch-making inventions, the groupings have been made irrespective of geographical lines.

The Sections of the Department of Industrial Arts thus far created are as follows, located in the Halls specified:

IN HALLS ADJOINING THE WEST COURT.

- Section of Animal Industries: Hall 22, Alcove 96.
 - Section of Fishery Industries: Hall 23, Alcove 97.
 - Section of Ceramic Industries: Hall 30, Alcove 107.
 - Section of Textile Industries: Hall 31.
 - Section of Gems, Gold, and Curios: Hall 32, Alcove 105.
 - Section of Miscellaneous Industries: Hall 33.
-

IN WEST PAVILION.

- Section of Metal-Working Industries: Hall 76.

IN EAST PAVILION.

Section of Transportation.

- A. Marine Transportation: Hall 37.
- B. Human Burthen-Bearers: Hall 38.
- C. Pack Animals: Hall 39.
- D. Land Vehicles: Halls 40 and 55.
- E. Steamboat: Hall 54.
- F. Street (or Tram) Cars: Hall 54.

The large objects in the North, East, and West Courts have been installed by and are assigned to the care of the Director of this Department.

HALL 22 AND ALCOVE 96.

SECTION OF ANIMAL INDUSTRIES.

In this Section will be found a valuable collection of tanned skins and leathers, exhibited at the Columbian Exposition in the United States Government Building by Tiffany & Co., which the Museum has recently acquired. This firm began to make this collection in 1876, in order to acquaint themselves with the industrial possibilities of using the skins of fishes, reptiles, birds, and rare mammals. It was the forming of this collection that has led to the introduction of the leathers made from the frog, alligator, snake, and other reptiles. Among the four hundred examples will be found leathers of the elephant, lion, camel, giraffe, monkey, cat, dog, crocodile, lizard, frog, shark, wolf-fish, etc., collected from Australia to Alaska.

Here also will be found an extensive collection of foot-wear and many other interesting objects, given to the Museum by the governments of Russia and Turkey, including an attractive collection of leather articles from Jerusalem. Also a fine collection of skins from the Argentine Republic.

Interesting models illustrating the advanced methods adopted for the slaughtering and shipping of cattle, etc., employed in a

typical Chicago abattoir, are also shown, together with models illustrating the means taken to prevent the infection of meats at Kansas City, and at cattle hospitals located elsewhere.

The cases which contain the series, showing how every part of an ox and hog of average weight is utilized, are of particular local interest.

Case 1.—Mounted Wolf-fish and articles made in Russia from Wolf-fish skins.

Case 2.—Fish and Reptile Leathers, collected by Tiffany & Co.

Case 3.—Reptile, Bird, and Mammal Leathers, collected by Tiffany & Co.

Case 4.—Mammal Leathers, collected by Tiffany & Co.

Case 5.—Waterbags, Harness, Pocket-books, Emblems, Pouches, and other manufactured articles, from Turkey and Jerusalem; Harness from Burmah; Shoe and boot uppers from Russia.

Case 6.—Skins of Mammals (tanned), collected by Tiffany & Co.

Case 7.—Skins of Mammals, from Turkey, Russia, and Argentine.

Case 8.—Small models of Cattle and Sheep, from Germany.

Case 9.—Footwear, from Turkey and Jerusalem.

Case 10.—Ornamented Turkish Shoes; Sandals worn by Buddhist Priests; Sandals, from Burmah.

Case 11.—Russian Shoes and Boots made from felt and leather.

Case 12.—Skins of Mammals from Argentine, Turkey and Russia.

Case 13.—Products of a Steer of average weight.

Case 14.—Products of a Hog of average weight.

No. 15.—Model of a Cattle Hospital at Garfield, N. J.

No. 16.—Model of a Cattle Quarantine Station at Kansas City, Mo., on south wall.

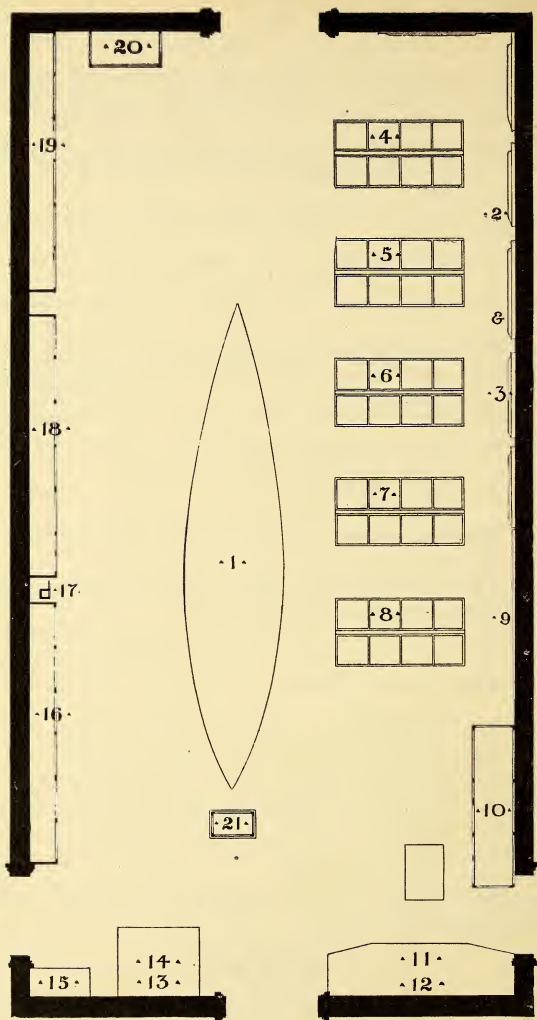
No. 17.—Model of a Cattle Abattoir at Chicago, showing machinery and methods of killing.

No. 18.—Model of Hog Abattoir at Chicago, showing method of killing and packing.

ALCOVE 96.

Case 1.—Skins of Mammals (tanned), collected by Tiffany & Co.

Case 2.—Skins of Mammals (tanned), collected by Tiffany & Co.



PLAN OF HALL 23.



HALL 23 AND ALCOVE 97.

SECTION OF FISHERY INDUSTRIES.

The Museum has been fortunate enough to acquire the very valuable collection which comprised the cabinet of curiosities of the Whale Ship "Progress," which, after many years' service in the Northern Seas, found a safe harbor in South Pond during the Exposition, where it attracted much attention.

The decadance of the whale Fisheries during late years renders this collection a most important addition to the Museum. It is not improbable that the time may come during the life of the present generation when the sperm and the right whale on the high seas will be almost as much of a curiosity as the Buffalo upon the prairie. The introduction of the modern harpoon (fired from a gun having taken the place of the hand lance is devastating the sea in a somewhat similar manner to the slaughter of the denizens of the prairie by the repeating rifle in the hands of the modern hunter.

Among the many interesting objects, the quadrant brought over in the "Mayflower" in 1620 will attract particular attention. The series showing the various stages in the development of the harpoon is also of special interest; also the large collection of whales' teeth and bones.

No. 1.—Original whale boat from Bark "Progress," fitted out ready for service, and containing life-size figures of six sailors.

Nos. 2 and 3.—Models of whaling ships; also pictures from cabin of the Whaler "Progress." On wall.

Case 4.—Sperm whale teeth, walrus tusks, and narwhal horns.

Case 5.—A collection of curios, such as yarn swifts, a set made from cowry wood; paper knives and canes made by sailors on board ship.

Case 6.—Sperm whale teeth and large narwhal horn.

Case 7.—Sperm whale teeth dressed and ornamented by sailors on board ship.

Case 8.—Log-books, charts, barometer, chronometer, compasses, and quadrants taken from old whalers, and a shipping list

published in New Bedford in 1847, giving an account of all American whalers in service at that time.

No. 9.—Shield on wall, containing slabs of whale-bone.

Case 10.—Curios from New Bedford whale ships; whale teeth; walrus heads and tusks; narwhal horns; saw-fish saws; sword-fish horns; porpoise, black-fish and shark jaws; skeleton of sea-snake; samples of different grades of whale and seal oil; whale and ship barnacles; wood from ship's bottom; ship's pitch-ers; and cast model of sperm whale.

No. 11.—Ribs and vertebrae of whale.

No. 12.—Lower jaws and ribs of sperm whale.

No. 13.—Shield on wall, containing blubber spades, harpoons, and lances, flencing and blubber knives and knife steels.

No. 14.—Copper cooling kettle, funnel, oil barrel, dippers and strainers used in trying out and barreling oil; blocks, hook, and tackle used in taking in "the blanket piece" on deck.

No. 15.—Cooper's tool-chest taken from the whale-ship "Progress."

Case 16.—A collection of implements used in whaling: guns, harpoons, and bomb-lances of the various kinds, illustrating the progress of the whaling industry.

No. 17.—Samples of the Cunningham line-carrying rockets.

Case 18.—Arctic clothing worn by members of the Greely Relief Expedition, including reindeer and felt sleeping bags; polar bear skins and felt suits; harness used by men when drawing sledges.

Case 19.—Articles collected from the South-Sea Islands, by sailors on whaling ships, including samples of tapa, or bark-cloth; suits made from grass; war suits and weapons; models of canoes and paddles; idol; heads carved from cocoa-nuts; and poi in dish.

Case 20.—Articles collected by sailors on whaling ships: samples of grass-cloth and rugs; articles made from grass-cloth from Madagascar; lady's work-box and two small chests made on board ship by sailors.

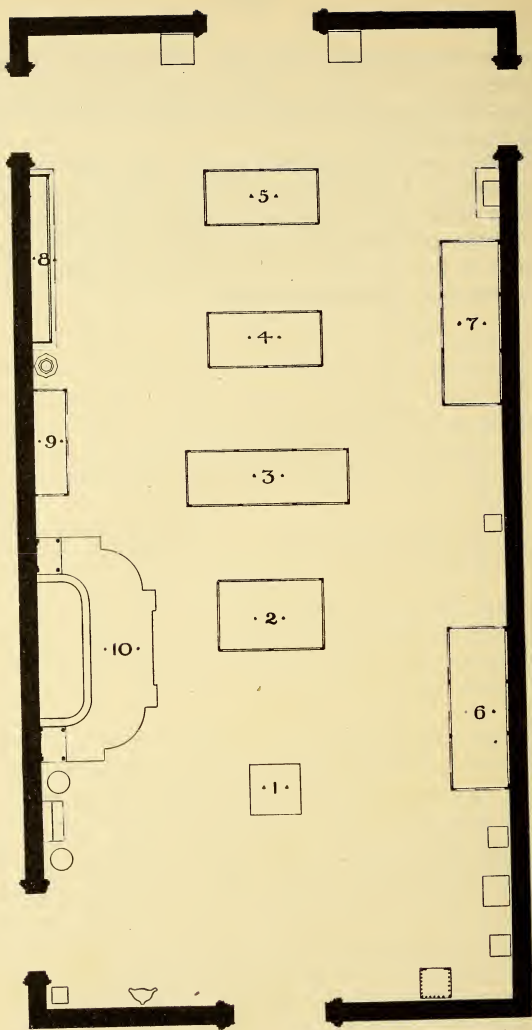
Case 21.—A collection of samples of oil of various qualities used for lubricating clocks, chronometers and watches.

In the **ALCOVE 97**, leading from the West Court, may be found nets, seines, and floats from Norway. A primitive stone anchor from Norway. Photographs of the Baltimore Fishing

School in Ireland hang on the walls. This important institution has rendered most efficient service in preparing young men and boys for duty in connection with the fisheries of Great Britain and the English Colonies.

A seine over one-quarter of a mile long, made in Russia; a fine collection of hooks from England; buoys, nets, fish-traps, etc., from other countries, are also located in this alcove.

Over the door leading from the Alcove to Hall No. 23 is a fine specimen of the Sturgeon; it is from this fish that the useful product known as fish isinglass is taken.



PLAN OF HALL 30.



HALL 30 AND ALCOVE 107.

SECTION OF CERAMIC INDUSTRIES.

In every part of the globe the introduction even of primitive ceramic arts marks a first step in the beginning of civilization. While the fabrication of Chinese and Japanese porcelain has extended over several centuries, the manufacture in Europe began in the eighteenth century. There the great masters of the art have for years enjoyed the patronage of kings and princes. The development of the art in America in late years is most encouraging. The handsome pavilion presented to the Museum by the Northwestern Terra Cotta Company of Chicago, which occupies a position in the West Court near the west entrance, is a fine example of the success achieved in artistic Terra Cotta work.

The most striking objects in the Section of Ceramics is the handsome pair of large royal blue Berlin Porcelain Vases, decorated with medallions, Cupids, and festoons of golden vines and raised flowers. They stand 9 feet 2 inches high, and are among the largest porcelain vases ever made, and were greatly admired by the thousands of visitors to the German Section in the Manufactures Building during the Exposition. They are a gift from Richard Horstman, of Berlin, and are of great value.

Gerard Dufraisseix & Co., of Limoges, France, also made a handsome contribution to this Section, consisting of a large porcelain center-piece for dining table, remarkable for success achieved in delicate coloring at high temperature.

Valuable collections of glassware and porcelains were contributed by the governments of Sweden and Japan, the Venice and Murano Co., The Worcester Royal Porcelain Co., and the Saint Mary's Porcelain China Works.

No. 1.—Large Royal Blue Porcelain Vases, manufactured by the Royal Porcelain Works, of Berlin, Germany; gift of Richard Horstman; height, 9 feet 2 inches.

Case 2.—Large Porcelain Center-piece for dining table, one of the largest pieces of hard French porcelain ever made; tints produced at high temperature with oxide colors; gift of E. Gerard Dufraisseix & Co., Limoges, France, through Haviland & Abbott, New York.

Case 3.—Mexican pottery; bowls, pitchers, vases, etc.

Case 4.—Samples of pottery made by the Indians in Central America. Pottery from Jerusalem, Jamaica and Venezuela.

Case 5.—Earthenware from Sweden and Guatemala.

Case 6.—Glassware, manufactured by the Venice & Murano Manufacturing Co., at their exhibit, Midway Plaisance, Chicago Day, October 9, 1893; gift of the manufacturers.

Vases, manufactured by the Worcester Royal Porcelain Co., England. Large Japanese plate, ornamented with gold, by Kakiyemon Lakar. Porcelain Plates, large and small, with gold decorations from Japan; gift of the Japanese government. Tea set of porcelain, covered with gold by "Chryso-Ceramic" process; gift of the Misses Healy, Washington, D. C. Vase, exact copy of the Royal Meissen (a German vase), with landscape in Jemtland, by Thörne. Porcelain Vase of Greek design, ornamented with gold, a copy of Maricbey similar to the Limoges ware. Porcelain plate with landscape. Gold and blue decorated plate. Porcelain dish ("China style"), and a vase similar to that manufactured by Winston (*pâte sur pâte*), from the potteries at Rörstrand, Stockholm, Sweden.

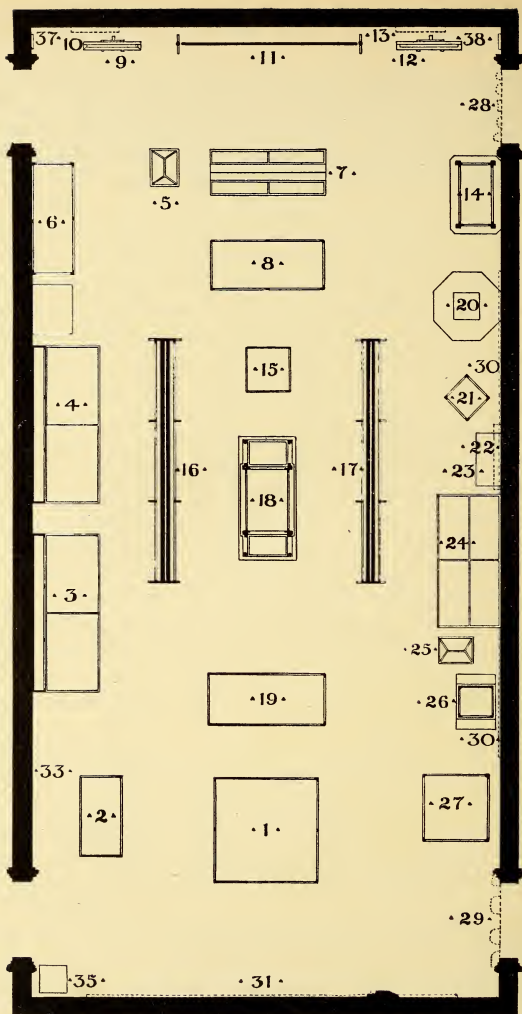
Case 7.—Glassware, manufactured in Ehrenfeld, Prussia.

Case 8.—Ornamented and Plain Bricks, made by Tiffany & Co., Chicago; gift of the manufacturers.

Case 9.—Clay statuettes (busts), made in Mexico by Pantaleon Panduro, San Pedro, Jalisco, Mexico; gift of the Mexican Commissioner to the World's Columbian Exposition. Pottery made in Guatemala.

Case 10.—Large ornamented Porcelain Vases from Japan; gift of the Japanese government. "Temptation" and "Victory" from Japan, made by Fugita Bunzo, Professor of Imperial Fine Art, Academy of Tokio. Porcelain statuettes of Gustave III and Bellman. Glassware, made by Venice & Murano Manufacturing Co. Large Clay Vases, from Sweden. Vases from Jamaica. Satsuma Vase, deposited by F. J. V. Skiff.

In Alcove 107 is placed three of the earthen wine jars which attracted great attention during the Exposition where they were located near the entrance to the Horticultural Building. These jars, which have a capacity of about 400 gallons, were in use for many years in the preparation of wine.



PLAN OF HALL 31.



HALL NO. 31.

SECTION OF TEXTILE INDUSTRIES.

In this Section it is desired eventually to show the beginnings and development in the art of weaving, thread and rope-making.

No other branch of Manufacture, perhaps, contributes so much to human comfort and happiness as the product of the loom. Progress in textile manufacture has always gone hand in hand with the development of civilization, and each step in the gradual mechanical perfection of the loom has reflected prosperity on the cotton plantation, the flax farm, and the sheep ranch.

The collection of textiles, though small, contains many objects of interest. Beginning with the old hand loom, constructed and used on the Kentucky frontier in the last century, many objects of interest are shown, made by the spinners and weavers of Java, Jamaica, Turkey, Russia, Bulgaria, Japan, and Korea, including the large linen damask table cloth manufactured in England for Queen Victoria, and exhibited in the British Section of the Manufactures Building during the Columbian Exposition.

Steps have already been taken to add to this Section at an early date, and collectors are already at work in Europe and elsewhere.

Case 1.—Loom used on Kentucky frontier during the last century.

Case 2.—Jamaica fiber ferns and articles manufactured therefrom.

Case 3.—Turkish silks and textiles.

Case 4.—Turkish silks and textiles.

Case 5.—Cocoons and raw silk from Bulgaria.

Case 6.—Raw Tusser and Muga silk and cocoons.

Case 7.—Enlarged models of silk worms. Moths and cocoons.

Case 8.—Japanese hand loom and two embroidered silk pictures. "Plum blossoms" and "Fujisan" (Sacred Mountain).

Case 9.—Japanese silk embroidered picture on easel, "White Phoenix" on "Paullonia Imperialis,"

The embroidered pictures (Cases 8 and 9) were donated by Shuno Shobey, of Yokohama, an expert in this artistic work, and are considered a novelty in Japanese embroidery of this character.

Case 10.—Ramie upholstering goods, Ramie plush goods, Ramie dress goods, Ramie corset covering.

Case 11.—Table cloth of linen damask, manufactured for H. R. H. Queen Victoria, by Robertson, Sedlie, Ferguson & Co.

Case 12.—Napkin; one of a set manufactured for H. R. H. Queen Victoria, by Robertson, Sedlie, Ferguson & Co.

Case 13.—Ramie white goods, fine Ramie table damask, Ramie laces, Ramie lace curtains.

Case 14.—Cord and twine manila and Irish hemp.

Case 15.—Specimens of Russian flax.

Case 16.—Fibers; collection from U. S. Agricultural Department, and articles manufactured from the same.

Case 17.—Fibers; collection from U. S. Agricultural Department, and articles manufactured from the same.

Case 18.—Wool: samples of natural fleece; also fleece scoured and bleached.

Case 19.—Korean silken garments and examples of satin rugs.

Case 20.—Rope; coil 250 feet long, gradually increasing in thickness from one-half to four inches in diameter, made of coconut fiber.

Case 21.—Pine fiber mattings, carpets, and rugs.

Case 22.—Rope and matting made of seath of shuro.

Case 23.—Oakum, felt, and waste jute.

Case 24.—Articles of household use and garments manufactured in Europe for South-American trade, and also manufactured in South-American countries.

Case 25.—Straw hats woven by natives of South and Central American countries and Mexico.

Case 26.—Russian cottons, raw and spun in yarn.

Case 27.—Laces of natural fiber from Fayal. Non-duty lace handkerchief from Paraguay. Silk embroidery worked in 1794. Colored worsted embroidery worked in 1794.

No. 28.—Baskets woven by natives in South and Central American countries, Mexico, and Fayal.

No. 29.—Baskets woven by natives in South and Central American countries.

No. 30.—Javanese feast mat, size 34 by 17 feet.

No. 31.—Tsuzure Mishiki tapestry, size 22 by 13 feet, representing the religious rites of the famous Nikko Temple.

No. 32.—Turkish rugs.

No. 33.—Persian prayer rug, size, 14 feet 10 inches long by 10 feet wide.

No. 34.—Spinning wheel (hand power).

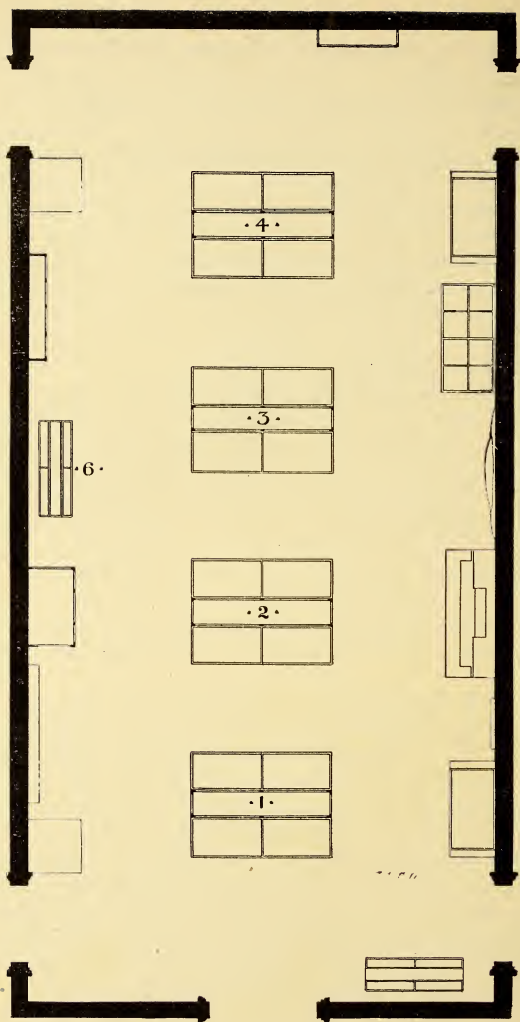
No. 35.—Spinning wheel (foot power).

No. 36.—Norwegian basketry.

No. 37.—Specimens of mattings.

No. 38.—Specimens of mattings.

No. 39.—Mexican colored hemp hammock.



PLAN OF HALL 32.



HALL 32.**SECTION OF GEMS, GOLD, AND CURIOS.**

The collections of gems and precious stones that during the Exposition attracted so much attention at the Tiffany pavilion in the Manufactures Building, and in the gallery of the Mines and Mining Building, believed to be the most complete in existence, contain nearly every known gem or precious stone, in the finest cut examples, in fine crystals, cleavages or rolled grains, always of gem value. Many of the objects of these collections are of historical interest and of world-wide reputation.

Cases 1, 2, and 3 contain

The famous Sun God Opal from the Hope collection, which is said to have been known in a Persian Temple for three centuries.

The diamond engraved by De Vrees of Amsterdam, shown in 1878 at the Paris Exposition, which required all of the engraver's spare time for five years.

A collection of over fifty diamonds in their natural state, and a crystal in the matrix from South Africa.

A quantity of gem gravel containing sapphire, chrysoberyl, zircon, tourmaline, and other gems in rolled pebbles from a Ceylonese river bed.

Ninety-nine (99) and sixty-six (66) karat yellow sapphires (oriental topaz), a fifty-nine (59) karat blue, also yellow, pink, white, and other colors. Fine red and blue and other colored spinels.

Tourmalines, green, red, blue, white, etc., from Brazil and Maine.

Superb examples of opal from Mexico, Queensland, and State of Washington.

The 352 karat Hope Aquamarine and other fine examples of sea-green, sea-blue, yellow, and other colors of beryl.

The Chilton double terminated emerald crystal, in a matrix of black limestone, from U. S. Colombia.

A fine series of Rock crystal from Madagascar, Brazil, Ural Mountains, and Herkimer county, New York.

Two large crystal balls from Mount Antero, Colorado, and Ashe county, North Carolina.

A large casket and tazza of rock crystal, mounted in jewelled and enameled silver.

Two thin polished sections of a large rich green jade boulder from New Zealand.

The collection as a whole illustrates the Oriental, Ceylonese, Aztec, English, German, French, and other methods of cutting, polishing, and engraving gems and precious stones.

Cases 3, 4, and 5.—These cases contain the Tiffany Collection of East India jewelry, and form the most complete series ever exhibited in any museum. Many of the pieces are very old and rare forms, consisting of rings, armlets, bosom ornaments, surah holders, ornaments for the forehead, hair, ear, waist, ankles, upper arm, etc., together illustrating the remarkable variety of the ornaments and of the jeweler's handicraft practiced in the East Indies for more than 2,000 years. The collection is divided into three sections:

First: Objects made from pure unalloyed gold, as worn by the higher caste only, containing diamonds, rubies, emeralds, sapphires, pearls, garnets, rock crystals, etc., and embellished with rich red and green enamels peculiar to the East Indian work.

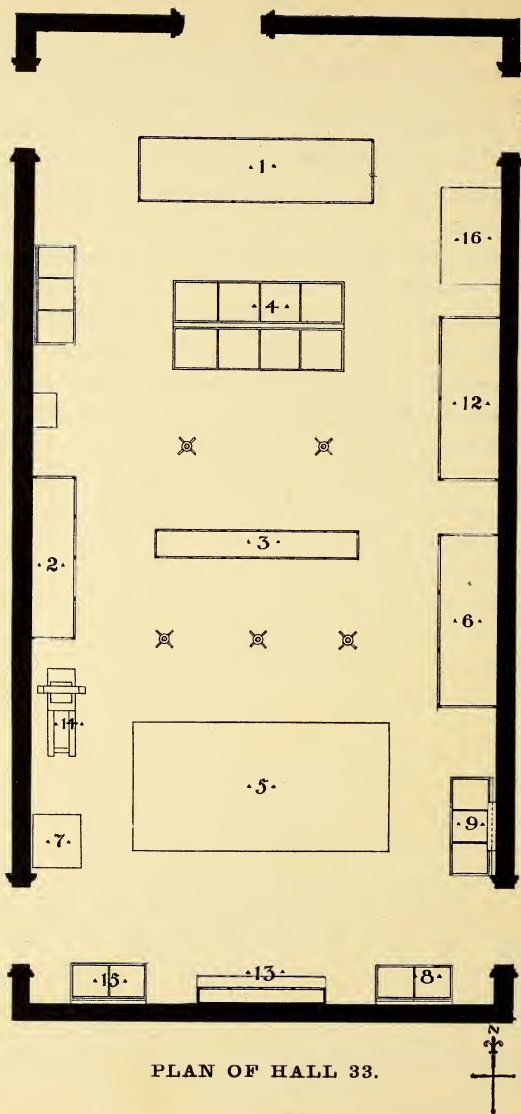
Second: Collection of silver jewelry consisting of many large and beautifully wrought pieces worn by a lower caste.

Third: A collection of base metal jewelry, worn by the lowest caste only.

Fourth: Two large silver maces carried in advance of the Maharajah by their attendants on state occasions.

Case 6.—The George F. Kunz collection of coins, illustrating

the metallurgy and mineralogy of coinage, numbering about 400 specimens. Examples are shown of coins made of gold, goloid, electrum, silver, billion, potin, aluminium, nickel, nickel alloy, bronze, gun-metal, bell-metal, copper, brass, iron, tin, pewter, lead, glass, and porcelain, and a few coins showing alteration, due to age and other agencies, as from bronze to malachite and azurite. Many of the coins are historical, such as the double ducat of Ferdinand and Isabella; the four daler piece of Sweden, weighing four pounds; siege and famine pieces of gun-metal; Arabian coins of glass; the ghost dollars of China, etc. This collection also illustrates the various forms of striking coins from dies made of steel, iron, and wood; coins cast from a mold, and pressed such as the glass coins, etc



PLAN OF HALL 33.

HALL 33.

SECTION OF MISCELLANEOUS INDUSTRIES.

In this Section of Hall are many objects of interest which do not properly belong to any of the Sections of the Museum so far created.

Case 1.—A valuable series of 65 specimens of flours, meals, etc., manufactured from the staple cereals.

Cases 2 and 12.—Articles manufactured of wood; plain, engraved, carved, and ornamented.

Case 3.—Curious objects.

Case 4.—The nucleus of a collection, which, when expanded, will illustrate the history of paper making and book and map printing and pictorial illustrations by the multiplying process.

Case 5.—Models and originals showing the development of the manufacture of the piano.

Case 6.—Series of models showing the various steps in the invention and perfection of the McCormick Mower and Reaper.

Case 7.—Old cannon, rifles, and shotguns.

Case 8.—Metal work made by scholars in a Russian training school.

Case 9.—Models of gun powders of various qualities.

No. 10.—Examples of Japanese lacquer work.

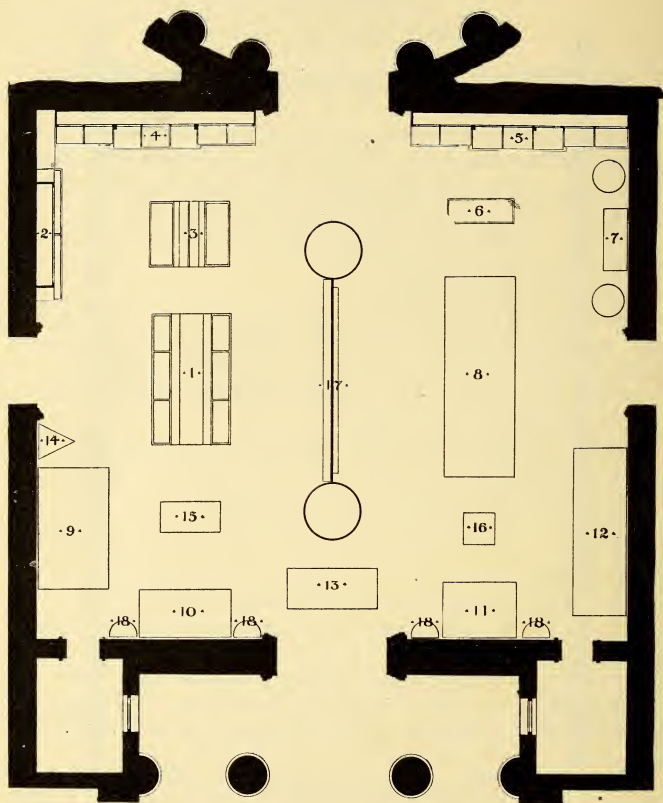
No. 11.—Japanese screens and partitions of paper, strengthened with wood or bamboo.

Case 13.—A collection of Antique Musical Instruments.

No. 14.—Old press, similar to those in use in the days of Franklin. This press was used by Ramage, the great artist and engraver.

Case 15.—Glass cutters and emery grinders.

Case 16.—Government Collection of Concentrated Feeds for Animals.



PLAN OF HALL 76.



HALL 76, WEST PAVILION.**SECTION OF METAL-WORKING INDUSTRIES.**

The Metallurgical Collection is rich in examples of the great work done by the iron founders and metal manufacturers of Germany, Sweden, Spain, England, and America.

Many of the best objects from the great Stumm exhibit, including the Statue of Vulcan in the East Court, are preserved in this Section.

Case 1.—An interesting exhibit of English Saw plates, Gear wheels, Wrenches, Cutters, and large Steel Castings from the firm of Jessop & Sons. In the lower part of the Case are large pigs of iron from Norway and Sweden, also crushed wheels and twisted bars of iron and steel.

Case 2.—Sections of steel bars, rails, and structural beams, from Spain, donated by Sociedad de Altos Hornos y Fábricas de Fierro y Acero de Bilbao. (The Society for the manufacture of high grade Iron and Steel, Bilbao).

Case 2A.—Scrap iron collection made by Swartz Iron & Metal Co., Chicago; a collection of all grades of scrap iron, steel, and metal. Also the finished product after its first heat, and sample of the iron when finished. It contains samples of different grades of iron and metal as it is sorted on leaving the scrap iron dealer's yard.

Case 3.—Samples of stone and marble which have been cut and polished with crushed steel; also specimens of the steel used in the process.

Cases 4 and 5.—Sections of rails and beams from the factory of Gebr. Stumm, Germany. In this Case is illustrated the method of crushing a number of bars of iron into one solid beam. A number of fractures of rails, beams, and bars are also shown.

Case 6.—A number of examples of fractures of steel and pig iron, showing the grade and quality of the metal.

Case 7.—Samples of wire, wire rope, and cable.

No. 8.—Exhibit of bent and twisted beams from the factory of Stumm & Co., exactly as exhibited by them at the Columbian Exposition.

No. 9.—Model of Chandler Iron Mine in Minnesota.

No. 10.—A model of rail rolling mill.

Nos. 11 and 12.—Models of annealing furnace and rolling mill for making structural iron, donated by Stumm & Co.

Nos. 13 and 14.—Tool steel bars from the Avesta Steel Works, Sweden.

No. 15.—Rims for locomotive wheels, and a solid steel shaft eight feet long, and examples of twisted tram-car axles and bars.

Nos. 16 and 17.—Bars and twisted pieces of iron and steel from Avesta Steel Works, Sweden.

No. 18.—Complete Reciprocating Rock Drill.

No. 19.—Dumping ore car used in modern iron mines.

No. 20.—Model of a Hot Air Blast furnace.

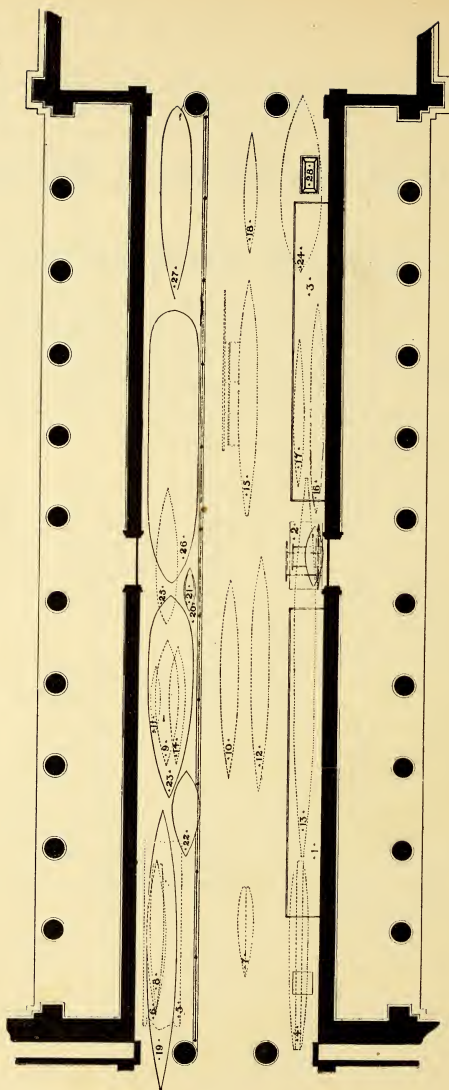
HALLS 37, 38, 39, 40, 55, AND 54, EAST PAVILION.

SECTION OF TRANSPORTATION.

Nearly three hundred years have passed since Lord Bacon wrote the lines, made more famous from the fact that they were inscribed upon the Golden Door of the Department of Transportation Exhibits of the World's Columbian Exposition, "There be three things which make a Nation great and prosperous—a fertile soil, busy workshops, and easy conveyance for men and goods from place to place."

It has been said that "The wheel is a dial by which can be reckoned the degree of progress of every civilization. When people learn how to make use of it, the crooked ways are made straight, the rough places smooth. Footpaths are replaced by level highways, bridges are built over streams once forded, intercommunication is accelerated, commerce is stimulated, and a rapid national development follows."

In the Section of Transportation all methods of marine and land conveyance are included, except the steam railway, which may be regarded as the culmination of the several series installed in the six Halls above enumerated. The exhibits are arranged in the order of development, beginning with the floating log and the human burthen-bearers and pack animals, continuing through methods of utilizing man and animals for traction, sledges and vehicles with wheels, and concluding with the street (or tram) car, which, when hauled by animals, marked the beginning of the present railway system.



PLAN OF HALL 37.

HALL NO. 37.

A. MARINE TRANSPORTATION.

In this Hall are installed an interesting series of original boats and models, illustrating various methods of marine conveyance, towing by man and beast, floating with the tide, propulsion by pole, oar, and sail.

Case 1.—Models illustrating the progress of improvement in primitive craft, beginning with the Chatti, or fisherman floating upon an earthen jar, and including various boats propelled by poles or oars. Other important objects are the Cingalese catamarans and outrigger canoes; the poorinda, a barge of state from Kashmir, India; an Imperial caique, the state barge of the Sultan of Turkey; the Mohr Punkee, or Peacock boat, of the Ganges, used by the Rajas and wealthier Hindoos as a pleasure boat; a barge from Burmah; state barge of the Governor of Kashmir, India; and finally the state barge of the Boa or Emperor of Burmah, a handsome boat with beautiful hand carvings.

Stand 2.—Upper boat. Model about one-thirtieth full size Dhoney, from Ceylon, a boat with outrigger and lugsails, used of for transportation purposes on the sea.

Lower boat. Model one-eighth full size. Fishing boat with outrigger, with lug sail, from Ceylon.

Case 3.—Models of oriental boats propelled by sails, beginning with the log raft, equipped with primitive sail; followed by the heavily laden Hindoo trading vessels moving by wind, and concluding with the great freight junk of the China coast—the highest development of the Asiatic sailing vessel. Among the many interesting objects in this case are East Indian cargo boats with loads, illustrating the Hindoo methods of combined sailing, rowing, and towing against the current; the Loungo and Louzgat, Burmese freight boats for transporting produce; the Likin, or Chinese revenue cutter, and an extensive series of junks that ply along the China coast.

No. 4.—Catamaran, or raft (original), from Colombo, Ceylon. This was formerly used for transporting the royal mails from Colombo, coastwise, about the island.

No. 5.—Bimba (original), a catamaran, or raft with sides. St. Paul de Loanda, Angola, Africa.

No. 6.—Balsa (original), boat made of rushes, Lake Titicaca, Peru. Used for general transportation purposes. Owing to its light draught large cargoes are often carried.

No. 7.—Balsa (original), boat made of rushes, Lake Titicaca, Peru. Used for transportation of one person only.

No. 8.—Cabilleteo (original), fishing boat, made of rushes Huanchaca, Peru. Used in fishing, especially in heavy surf.

No. 9.—Donga (original), from Benguela. Africa. A very primitive dugout. The addition of the strip along the gunwale is one of the earliest efforts to increase height of sides of the boat.

No. 10.—Dugout (original), from Seneca Indian Reservation, New York. Typical dugout of the Indians of the interior of the Northeastern United States.

No. 11.—Dugout (original), for carrying two persons. Colon, Colombia, South America.

No. 12.—Corial (original), made by the Accawoi Indians, headwaters of the Demerara river, British Guiana, South America. This is the highest type of dugout canoe made by savages of any country, and is not patterned after the craft of any civilized race.

No. 13.—Tlo (original), a dugout for fishing purposes, made by the Bella Coola Indians, near Fort Wrangel, Alaska.

No. 14.—Dugout (original), from the headwaters of Rio Ozama, San Domingo. Made by Indians, but showing European influences in both exterior and interior form. Used by natives in transporting produce from the upper river to the coast towns.

No. 15.—Surf Canoe (original), with outrigger, Apia, Samoa. Used for general transportation and fishing where surf is heavy.

No. 16.—Woodskin (original), made by Accawoi Indians on headwaters of Rio Essequibo, British Guiana, South America. The most primitive form of the bark canoe.

No. 17.—Birchbark (original), Upper Yukon River, Alaska. The highest type of bark canoe made by savages are made by the Indians of North America.

No. 18.—Kyak (original), a decked skin boat used by Esquimaux of America, Asia, and Europe in hunting and fishing, Port Clarence, Alaska.

No. 19.—Caique (original), or row-boat. Constantinople, Turkey. A pleasure boat.

No. 20.—Stand. Model of fishing boat used near Curacoa, Danish West Indies.

No. 21.—Model of punt, or scow, used for ferrying and general transportation purposes in the harbor of Curacoa, Danish West Indies.

No. 22.—Stand. Model of fishing boat of the type used on the Sea of Gallilee in time of Christ. The model was made in Syria.

No. 23.—Daighsa (original), a pleasure boat used in the harbor of Valetta, Malta.

No. 24.—Clinker built fishing boat (original), used in the cod fisheries of the Lofoten Islands. From Bodoe, Nordel, and Norway.

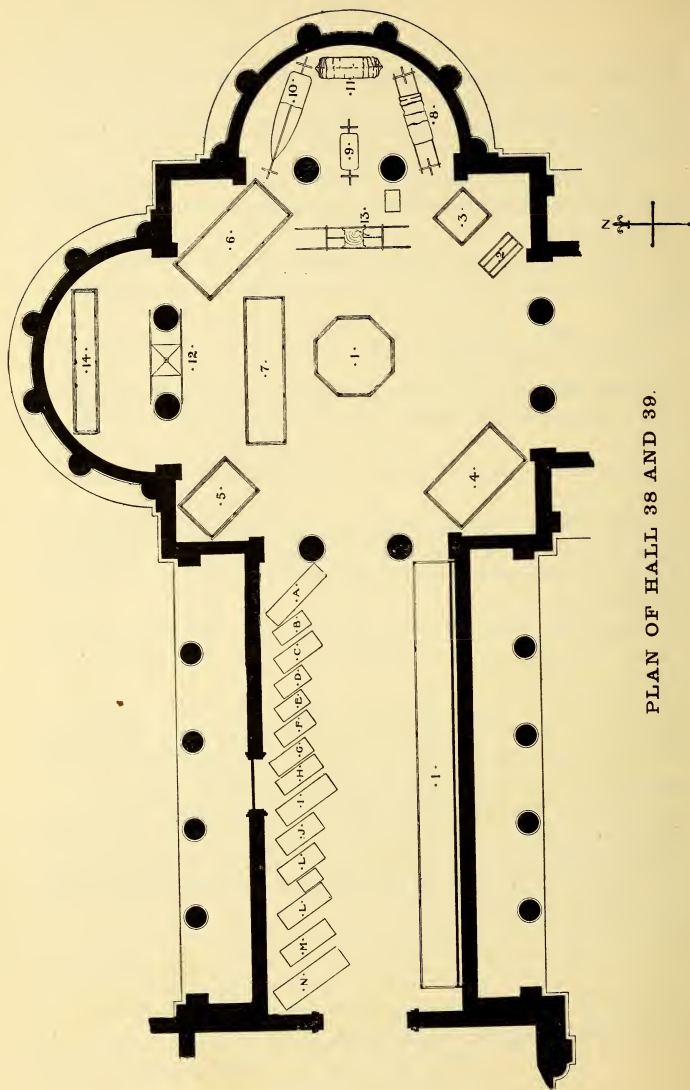
No. 25.—Dugout, with sail (original). Colon, Colombia South America.

No. 26.—Bragazza (original). A two-masted fishing vessel of Venice, Italy. The sails are artistically painted, showing the survival of ancient Phoenician art influences among the Adriatic fishermen.

No. 27.—Single-masted pleasure boat (original), from Arendal, Nedenaes, Norway. Ornamented at stem and stern by hand carvings. Clinker-built.

No. 28.—Stand. Wooden model of the "Santa Maria." A piece of wood from each Exposition Building (except concession stands), erected before May 1st, 1893, in Jackson Park, is incorporated in this model, which is made to an exact scale.

On the North and South Walls are hung pictures from the West Coast of South America, from Africa, Asia, and the United States—illustrating many primitive and other craft, including types of the highest development of wooden-bottomed American sailing vessels.



PLAN OF HALL 38 AND 39.

HALL 38.

B. HUMAN BURTHEN-BEARERS.

Case 1.—Indian, from Colombia, South America, (life-sized figure), carrying a Silla, or traveling chair, in which is seated an American on his way from the coast to Bogota, the capital.

Case 2.—Models of thirteen Cargadores, male and female, illustrating the primitive methods of transportation which prevail in Latin-America.

Case 3.—Negro woman "toting," Southern United States, (life-sized figure). Carrying objects on the head is a common method in the South.

Case 4.—Male and female Indian Cargadores (life-sized figures), transporting goods from Guayaquil, the seaport, to Quito, the capital of Peru.

Case 5.—Porter (life-sized figure) in a street of Constantinople, transporting a case destined for the Columbian Exposition.

Case 6.—Three peddlers (life-sized figures), walking abreast along a street of Constantinople, Turkey, carrying milk, bread, and water.

Case 7.—Sedan chair containing a wealthy lady, who is being transported from one part of Constantinople to another, by two carriers. (Life-sized figures.)

Case 8.—A primitive Palanquin, Antananarivo, Madagascar.

Case 9.—A Maxilla, or palanquin, from Saint Paul de Loanda, Angola, Africa.

Case 10.—A traveling Hammock, Funchal, Madeira.

Case 11.—The Palanquin which Mrs. French-Sheldon used as a carriage, a boudoir, and a drawing-room during her explorations in Eastern Africa.

Case 12.—Sedan chair used by the ladies of Bogota, Colombia.

Case 13.—Fire Extinguisher, with Sergeant of the Fire Department, Constantinople, Turkey.

Case 14.—Models of Sedan Chairs from China (the home of the sedan chair) and from India; also models of Hindoo porters carrying bales, etc.

HALL 39.

C. PACK ANIMALS.

The Museum has been particularly fortunate in acquiring by gift from the Department of Transportation Exhibits of the World's Columbian Exposition a very full series of pack animals and saddles. The animals, equipped for the journey, stand on the East side of the Hall, and the saddles in a case on the opposite side. Among the most interesting objects in this hall are the pack-saddle of Syria on the camel; the pack-saddle with bales, accompanied by an Arriero, or mule driver, of Bogota, Colombia; the Lechera, or woman milk peddler, of Ecuador, South America; and the Vaquero, or cattle herder, of Colombia, South America.

Case No. 1.—In the saddle case are shown different stages in the development of pack and riding saddles, including a specimen of the primitive American pack-saddles, with Esterialtas, or plantain saddle pads; the skeletons saddles of the Cheyenne warriors; various Turkish saddles, including the beautiful one formerly used by the Sultan; three very handsome Latin-American saddles, including one heavily ornamented with solid silver, and two specimens of Asiatic harness. On the walls are pictures of pack animals from Mexico, South America, West Indies, and Persia.

A.—Camel with pack-saddle, showing method of transporting goods across the Syrian desert.

B.—Llama, with blinds, transporting rawhide portmanteaus, Peru, South America.

C.—Llama, with blinds and panniers, such as are in common use in Peru, Bolivia, and Ecuador, South America.

F.—Burrito (or young burro). Peru, South America.

G.—Donkey, with rush saddle in which water jars are transported. Jerusalem.

H.—Burro, with rush saddle; the most important beast of burthen in all Latin-American countries. Peru, South America.

I.—Donkey, with Syrian bridle and pack-saddle. Jerusalem.

K.—Burro, with pack-saddle of plantain leaves. Peru.

L.—Mule, with pack-saddle loaded with two bales destined

for Columbian Exposition, accompanied by an Arriero, or mule driver. Bolivia, South America.

M.—Lechera, or woman milk peddler. Ecuador.

N.—Vauquero, or cattle herder, in costume, equipped with twisted rawhide lariat and rope tether and mounted on a mule. Colombia.

HALLS 40 AND 55.

D. LAND VEHICLES.

In Halls 40 and 55 are installed a number of vehicles from widely separated portions of the earth. The most interesting are the dog-sleds of Arctic America, and those of sub-tropic Madeira; the Etruscan racing chariot, which is interesting in that it differs typically from both the Assyrian and Egyptian chariots in the number of its spokes. The rolling hogshead is a relic of Colonial days, and the Mexican cart with solid wheels without spokes, illustrates the introduction of the wheel vehicle in civilization. The decorations of the Sicilian cart are of a religious nature, as might be supposed. The Volante, a Cuban carriage for two persons, is generally drawn by two horses hitched tandem, the leading horse being almost in front and a little to the left of the wheel horse. Examples of hubs, spokes, and bent-wood used in modern carriage and wagon making are shown, as is also a series of models very fully illustrating Hindoo and Burmese wagons and carriages, and Ceylon carts.

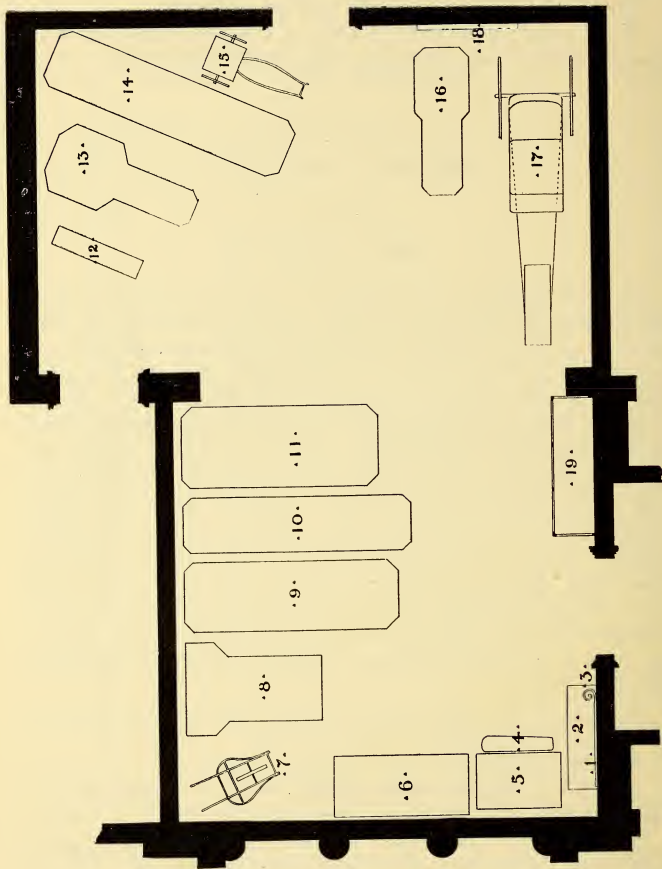
No. 1.—Dog sled, with bone shoes and sealskin harness. Smith Sound, Greenland.

No. 2.—Dog sled. Port Clarence, Alaska.

No. 3.—Toboggan, with harness, drawn by dogs. Norton Sound, Alaska, on wall.

No. 4.—Corca, or freight sled, Funchal, Madeira; drawn by bullocks. Though the snow never falls in Madeira, the only vehicles drawn by animals are sleds.

No. 5.—Carro de Monte, or mountain sled, Funchal, Madeira. Made of rattan, and finished in red cloth and mahogany.



PLAN OF HALLS 40 AND 55.

No. 6.—Carro dos Boss, or mountain sled, with canopy, Funchal, Madeira. Intended for four persons.

No. 7.—Passenger wheel-barrow, Amoy, China. Used to transport travelers from point to point within the city. The passenger places one foot against the front cross-bar, allowing the other to swing free, and rests one arm on top of the wheel shield.

No. 8.—Racing chariot. Replica of the type used in Etruria in prehistoric times.

No. 9.—Rolling hogshead, with yoke of oxen and negro driver, as used in Virginia in Colonial days to transport tobacco from the plantation to the Jamestown and Richmond markets.

No. 10.—Palanquin for passengers, transported by mules. A common mode of conveyance in the Orient. Jerusalem.

No. 11.—Carreta ox cart, wheels without spokes, made by the Indians of the Pueblo of Acoma, New Mexico, with pair of oxen yoked according to the Mexican method.

No. 12.—Mounted specimen of gour ox, used as a draught animal in India.

No. 13.—Red River cart and harnessed ox. The only method of transporting goods northwest of St. Paul, Minnesota, previous to 1871. In the early days oxen only were used, but now ponies have displaced them. One pony often draws a load of from 800 to 1,000 pounds over the prairie.

No. 14.—Araba Codja, a country carriage drawn by a pair of oxen, Constantinople, Turkey. The gaudy harness and hangings make this a most picturesque specimen.

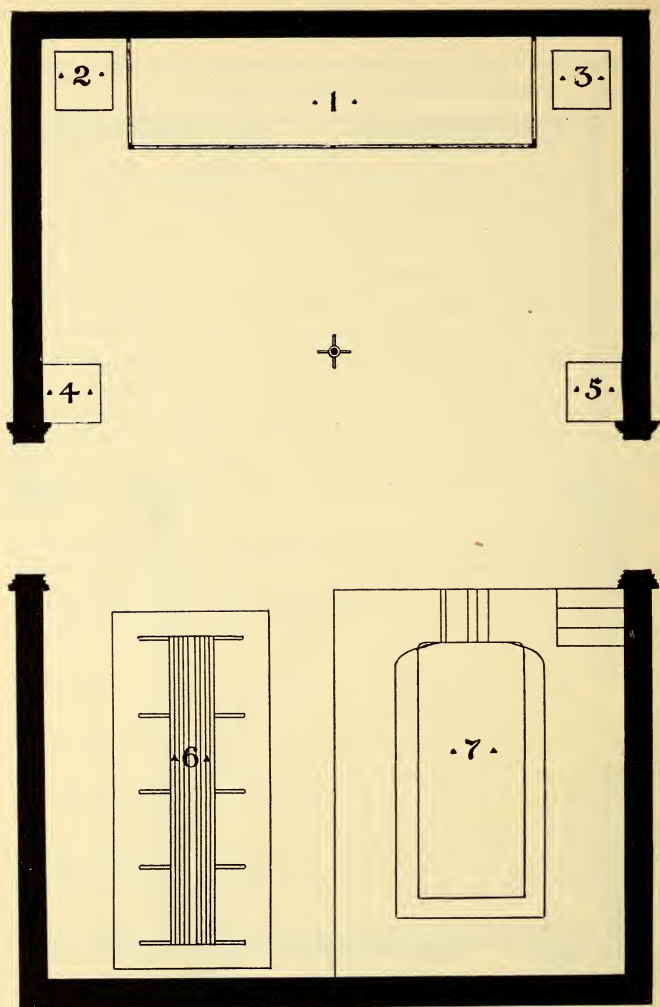
No. 15.—Man Ghurry cart, drawn by man, Surat, India. Largely used for transporting goods within the city.

No. 16.—Pleasure cart for holy-day use, Palermo, Sicily, with donkey and ornamented harness.

No. 17.—Volante, Havana. A carriage in common use on the island of Cuba. Drawn by two horses, hitched nearly tandem. A postilion rides the leader, and the passenger drives the shaft horse.

No. 18.—Bent and turned wood of all descriptions used in wagon building. Various sections of New South Wales, Jamaica, and the United States, on wall.

Case No. 19.—Models of the most important Ceylon carts used for freighting, and various Turkish, Hindoo and Burmese wagons drawn by bullocks and horses. Also a model of the American cart used for hauling earth, coal, etc.



PLAN OF HALL 54.



HALL 54.

STEAMBOAT AND STREET CAR.

In the hall devoted to the Steamboat and the Street Car is a model of an Ohio river steam tow boat, with a large tow of coal barges; also a complete model of a Mississippi river steamer towing a large raft of Minnesota logs, a method of timber transportation rapidly passing away.

At the opposite end of the hall stands the first grip-car ever run in passenger service. This was built under the direction of Mr. A. S. Hallidie, and used on the Clay Street Railroad of San Francisco, California, in the year 1872. Another holds specimens of steel used in the operation of cable and electric roads in Germany.

On the walls of this hall are many pictures representing steamboats and street cars of various countries, including steamboats on Lake Titicaca, Peru. This lake is the highest navigable body of water on the earth, and the steamboats which ply upon it are made in sections and transported up the mountains on the backs of mules.

Case 1.—Model of a raft of logs on the Mississippi river being towed by the stern-wheel steamboat "Juniata." The steamboat is hitched to the raft bow on, and by means of guy-ropes run to the nearest corners of the tow, the steamboat is made to direct the course of the raft. The model of the steamboat is of metal. The model of the raft is made of white pine branches, cut in northern Wisconsin. Both boat and raft are constructed on $\frac{1}{4}$ -inch scale.

Model of a steam tow-boat, with a large tow of coal, representing the method of transporting coal from Pittsburgh to New Orleans. The larger barges carry the freight, and the small ones the coal for steamer fuel. The steamer represented is 200 ft. long and 42 ft. wide, with cylinders 24 inches in diameter, and 12 ft. stroke of piston, and 7 boilers. The barges are each 130 ft. long, 25 ft. wide, and $7\frac{1}{2}$ ft. deep, each carrying about 13,000 bushels of coal. The steamer and tow, when running, occupy a space of 700 feet long and 150 feet wide.

No. 2.—Statue of Fulton.

No. 3.—Statue of Ericcson.

No. 4.—Statue of Papin.

No. 5.—Statue of Watt.

These statues were located at the south front of the Transportation Building during the Exposition.

Stand 6.—Cable and electric street railway track appliances, wheels, wheel sections, rims and spokes, fish plates, rails, rail sections, frogs, and crossings, and ties.

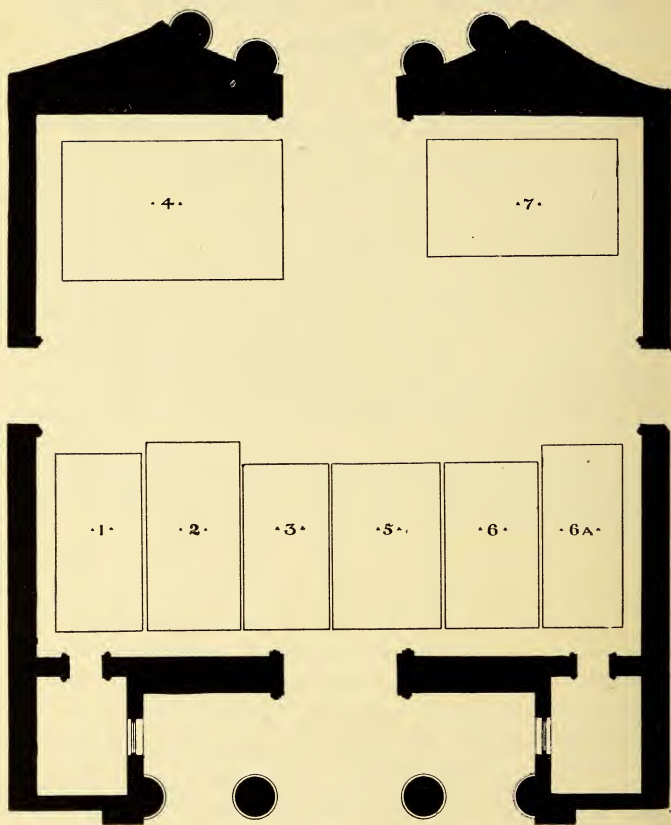
Stand 7.—Represents a section of Clay Street, San Francisco, in 1872. On this street was placed and operated the first cable railroad of the world. A section of the cable road, including original yokes and rails, and the first grip-car run for public use on any cable street railway. On the stand are specimens of original yokes and the first original grip, which was made for Mr. A. S. Hallidie, the inventor of the cable railway, in 1872. A small model of the grip, together with models of two cars, is also here. At the end of the stand are two yokes used on the cable railways of Germany. A large drawing of Stephenson's first street car is also here.

The visitor then enters Hall No. 53 of the Museum of the World's Railway, in which is installed the models illustrating the first experimental steps in the invention of the steam locomotive.

MUSEUM OF THE WORLD'S RAIL WAY.

The Museum of the World's Rail Way, occupying the East Pavilion, is designed to illustrate, largely through full-sized reproductions and originals, the evolution and development of Permanent Way, Structures, Motive Power, Equipment, and Appliances. The nucleus of this representation is in the extensive collection made by the Baltimore & Ohio Railroad Company for the Columbian Exposition, and presented in entirety to the Field Columbian Museum. This collection embraces thirty-eight full-sized working reproductions, covering the period from the initial idea of steam propulsion on land, 1680, to the first "Camel" engine of 1848, and nine original locomotives, including examples of the practice followed from 1832 to 1876. In addition there are nearly eighteen hundred uniformly mounted and framed examples in original wash-drawings, detail plans, photographs, prints, and lithographs, illustrating the evolution and development of the railway in every land where the locomotive whistle has been heard.

The interesting collection made by the Pennsylvania Railroad Company for the Exposition is also in the Museum, and it tells in a graphic and instructive manner the story of the progress of this great railroad corporation by series of models and originals. The Baldwin Locomotive Works contributed the full-sized working reproduction of the "Old Ironsides," the first of the Baldwin engines, and the Rogers Locomotive Works the full-sized working reproduction of the "Sandusky," the first Rogers engine. The Philadelphia & Reading Company contributed the "Rocket," the original No. One on that road; the Illinois Central Company the "Mississippi," the original first locomotive in the Gulf States; the Chicago & North-Western Company the "Pioneer," the original first locomotive west of Chicago, and the Mount Washington Railway the original engine, the "Peppersauce," the first mountain-climbing locomotive in the world. The World's Exposition, through the Chief of the Department of Transportation, pre-



PLAN OF HALL 53.



sented to the Museum the "Samson" and the "Albion," the original first and second locomotives in Nova Scotia, together with the original first passenger car in that country and the two original first cars drawn on rails by a locomotive in the world, those from the Merthyr Tydvil tram road in South Wales.

In each instance the engines—the originals and reproductions—stand upon either the original or an exact counterpart of the track of their period.

It is suggested that visitors inspect the Halls in the order in which they are described, as in this manner evolution and development may be followed chronologically. On each original engine, as well as upon each reproduction, will be found cards affording much historical information.

HALL 53.

No. 1.—Full size working reproduction of the "Newton," England, 1680; the first idea of propulsion by steam on land in history.

No. 2.—Full size working reproduction from the measurements and detailed drawings made from the original in the Conservatoire des Arts et Metries, Paris, of the "Cugnot," France, 1769; the first actual propulsion by steam on land in the world.

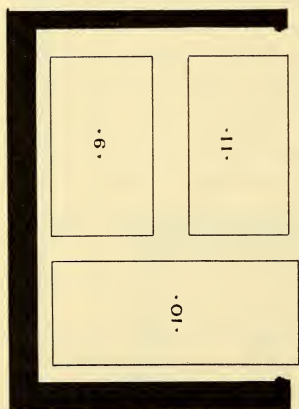
No. 3.—Full size working reproduction of the "Murdoch," England, 1784; first propulsion by steam on land in Great Britain.

No. 4.—Full size working reproduction of the "Read," America, 1790; the first idea of steam propulsion on land on the American continent.

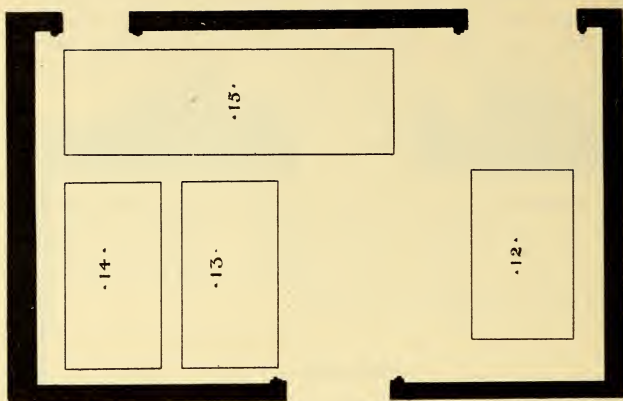
No. 5.—Full size working reproduction of the "Trevithick," England, 1800; the first effort of the father of the locomotive.

No. 6.—Full size working reproduction of the "Trevithick," England, 1804; the first locomotive on rails in the world.

Nos. 6A and B.—In connection with this are two of the first five cars drawn by a locomotive in the world, they having been attached to the "Trevithick" of 1804, on the "Mythyr Tydvil" tram road in South Wales. These are the original cars in their original form, standing upon the original rails, which in turn are upon the original stones laid on the South Wales tram road in 1800.



PLAN OF HALL 51.



PLAN OF HALL 52.

No. 7.—Full size working reproduction of the "Trevithick," 1808, the first locomotive on rails in England.

Upon the Walls, series of original large wash-drawings, indicative of the early stages of the evolution of the locomotive. Also, series of original drawings by Theodore Cooper, showing the evolution and development of the railroad bridge of the world. Also, series of bromides of scenes on railroads in foreign countries.

HALL 52.

No. 8.—Full size working reproduction of the "Evans," America, 1804; the first actual propulsion by steam on land on the American continent, and the first practical propulsion by steam on land in the world.

No. 9.—Full size working reproduction of the "Blenkensop," England, 1812; the first locomotive for actual commercial purposes in the world, it running on a rack road.

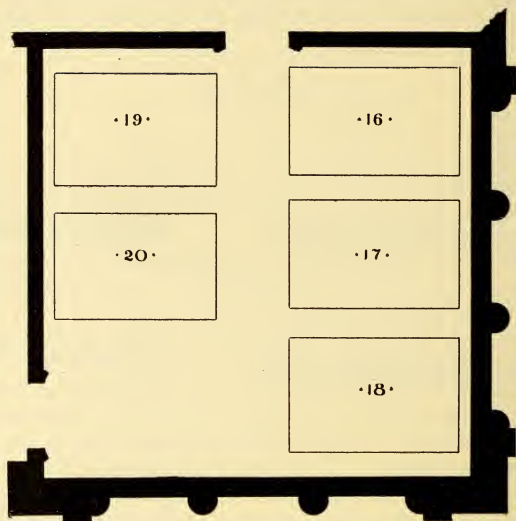
No. 10.—Full size working reproduction of the "Brunton," England, 1813; the horse-leg locomotive.

No. 11.—Full size working reproduction of the "Hedley" model, England, 1813, with which the first practical demonstration of the adhesion of smooth wheels to smooth rails was made.

On the Walls, continuation of the Theodore Cooper series of the evolution and development of the railroad bridge; also a continuation of the large wash-drawings showing the evolution of the locomotive. Likewise, a further series of bromides of railroad views in foreign countries.

HALL 51.

No. 12.—Full size working reproduction of the "Puffing Billy," England, 1813, built by Hedley immediately after demonstrating the adhesion of smooth wheels, this locomotive being thus constructed. The "Puffing Billy" is from the measurements and drawings made by the authorities of the South Kensington Museum in London, the original engine, the oldest in the world, being preserved in that institution.



PLAN OF HALL 50.

No. 13.—Full size working reproduction of the “Blucher,” England, 1814; George Stephenson’s first locomotive.

No. 14.—Full size working reproduction of the “Howard,” America, 1828; the first locomotive patented in America.

No. 15.—Full size working reproduction of the “Seguin,” France, 1827-28; the first locomotive in France, and the first locomotive in the world with a multi-tubular boiler.

Upon the Walls, concluding series of the Theodore Cooper drawings of the evolution and development of the railroad bridge. Also, series of large wash-drawings showing the evolution of the locomotive steam carriage period, and series of views illustrative of railroad operation in foreign countries.

HALL 50.

No. 16.—Full size working reproduction of the “Rocket,” England, 1829; George Stephenson’s successful locomotive in the Rainhill trial, the first locomotive contest in the world, the reproduction being from the original drawings.

No. 17.—Full size working reproduction of Timothy Hackworth’s “Sans Pariel,” England, 1829; the first locomotive constructed with steam blast, and also a competitor in the Rainhill trial, the reproduction being from the measurements and detail drawings furnished by the South Kensington Museum, the original engine being in that institution.

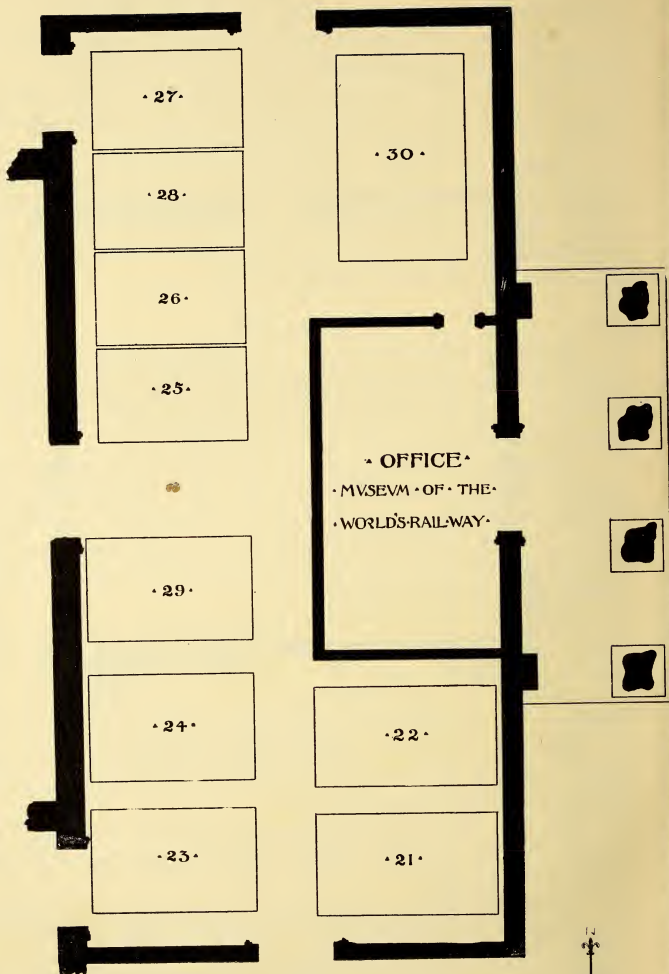
No. 18.—Full size working reproduction of Ericson’s “Novelty,” England, 1829; the first tank locomotive, and also a competitor in the Rainhill trial.

These three reproductions stand upon the stones, rails, and chairs of the original track upon which the trial took place.

No. 19.—Full size working reproduction of the “Stourbridge Lion,” England, 1829; the first locomotive seen in America, it having been imported the year named.

No. 20.—Full size working reproduction of Peter Cooper’s “Tom Thumb,” America, 1829-30; the first locomotive built on the American continent.

Upon the Walls, continuation of the wash-drawings, showing the evolution of the locomotive of the world. Also, continuation of the series of bromides, illustrating scenes on railroads in foreign countries, and a series of photographs showing modern bridges and railway appliances.



PLAN OF HALL 49.

HALL 49.

No. 21.—Full size working reproduction of the "Best Friend," America, 1830; the first locomotive built on the American continent for actual service.

No. 22.—Full size working reproduction of the "Mercury," England, 1830; George Stephenson's highest type of development, and the father of the standard English engine.

No. 23.—Full size working reproduction of the original "York," America, 1831; Phineas Davis' first locomotive.

No. 24.—Full size working reproduction of the "Johnson," America, 1831; the first locomotive with a double firebox.

No. 25.—Full size working reproduction of the "James," America, 1831; the first suggestion of the link motion.

No. 26.—Full size working reproduction of the "Costell," America, 1831; first locomotive with oscillating cylinders.

No. 27.—Full size working reproduction of the "Child," America, 1831; first rotary locomotive.

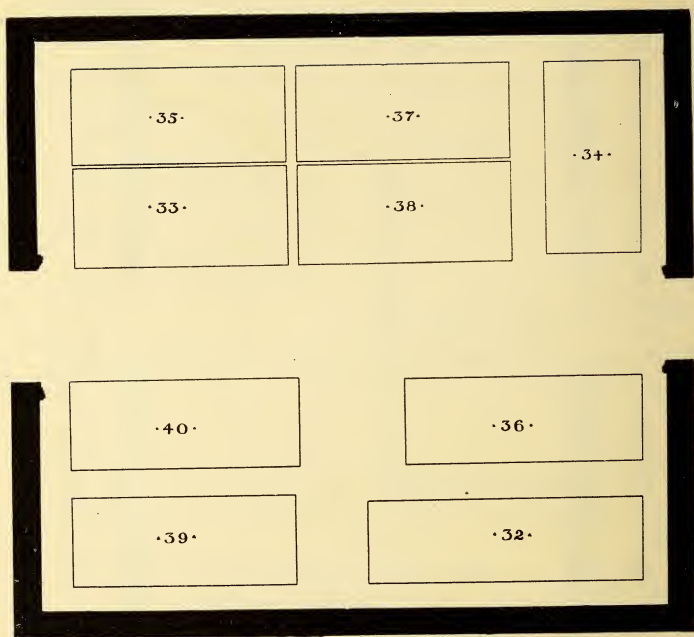
The five locomotives last mentioned were competitors in the Baltimore & Ohio locomotive competition or trial in 1831, the first event of this character on the American continent. The "York" was the winner.

No. 28.—Full size working reproduction of the "James," America, 1832; the first locomotive in the world with link motion.

No. 29.—Full size working reproduction of the remodeled "York," America, 1831; the first of the distinctively "Grasshopper" type.

No. 30.—Full size working reproduction of the "Old Ironsides," America, 1832; the first Baldwin locomotive.

On the Walls, photographs on canvas by Wm. H. Jackson, and retouched by Thos. Moran, of Harper's Ferry, Buckhorn Wall, and Fairport; these photographic results being eight feet high and sixteen feet long. On the East, North, and West walls of this room is a series of original drawings, lithographs, and photographs, illustrative of the development of the Baldwin locomotive from 1832 to 1893; on the walls in the Southern half of the room are a series of original drawings, lithographs, and photographs, illustrating the progress as manufacturers of the Portland Locomotive Works, the New Jersey Locomotive Works, and the Cooke Locomotive Works.



PLAN OF HALL 56.



HALL 56.

No. 32.—Full size working reproduction of the "South Carolina," America, 1832; the first double end locomotive in the world.

No. 33.—The "Atlantic," America, 1832; original engine, and the oldest locomotive in its original form on the American continent.

No. 34.—Full size working reproduction of the "Experiment," America, 1832; the first locomotive constructed in the world with the forward or "bogie" truck.

No. 35.—The "Traveller," America, 1833; original locomotive, and the first in the United States built expressly for freight purposes. This engine has a record of sixty years of actual service, a locomotive record without a parallel in history.

No. 36.—Full size working reproduction of the "Hercules," America, 1837; the first locomotive in the world with equalizing frame and levers.

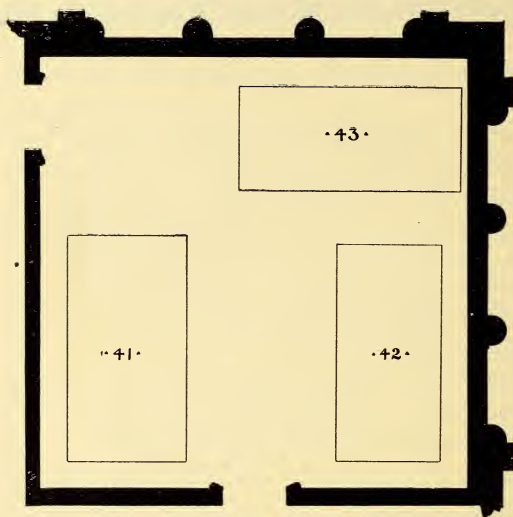
No. 37.—The "Thomas Jefferson," America, 1836; an original locomotive of the "Grasshopper" type, the first with cab for engineer and fireman, and the first Winans engine.

No. 38.—The "Mazeppa," America, 1837; original locomotive, and first of the "Crab" type.

No. 39.—Full size working reproduction of the "Campbell," America, 1836; the first or father of the American type of eight wheel passenger locomotive.

No. 40.—Full size working reproduction of the "La Fayette," America, 1837; the type of the first Norris locomotive with adhesion sufficient to surmount heavy grades.

On the Walls, photographs by Wm. H. Jackson and retouched by Thomas Moran, of the cities of Pittsburgh and Washington. Also a series of original wash-drawings, showing the development of the locomotives of the world. Also a series of bromides from direct photographs of English historical locomotives.



PLAN OF HALL 48.



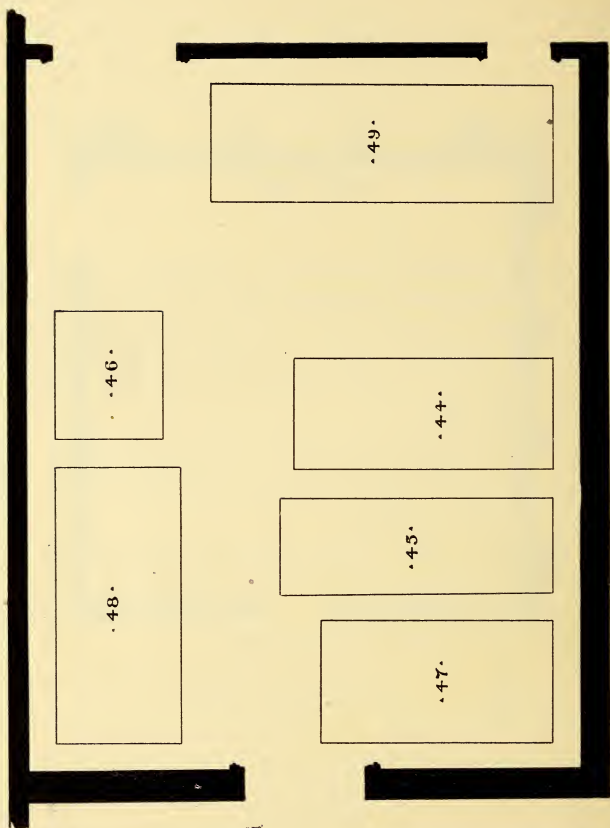
HALL 48.

No. 41.—Original locomotive, "Mississippi," built in England in 1834, imported to America in 1836, and the first locomotive in New Orleans, it standing upon a section of the original track.

No. 42.—Full size working reproduction of the "Sandusky," America, 1836; Rogers' first locomotive, and the first locomotive west of the Ohio River.

No. 43.—Original locomotive "Rocket," England, 1838; built by Braithwaite, London, and the first locomotive on the Philadelphia & Reading Railroad.

Upon the Walls.—Original drawings, specifications, lithographs, and photographs, showing the development of the Rogers' locomotive; also a series of large wash-drawings, showing the development of the locomotive of the world.



PLAN OF HALLS 46 AND 47.



DOUBLE HALL 46 AND 47.

No. 44.—Original engine "Samson," England, 1838; built by Timothy Hackworth, and the first locomotive in Nova Scotia.

No. 45.—Original engine "Albion," England, 1839; built by Hackworth, and the second locomotive in Nova Scotia.

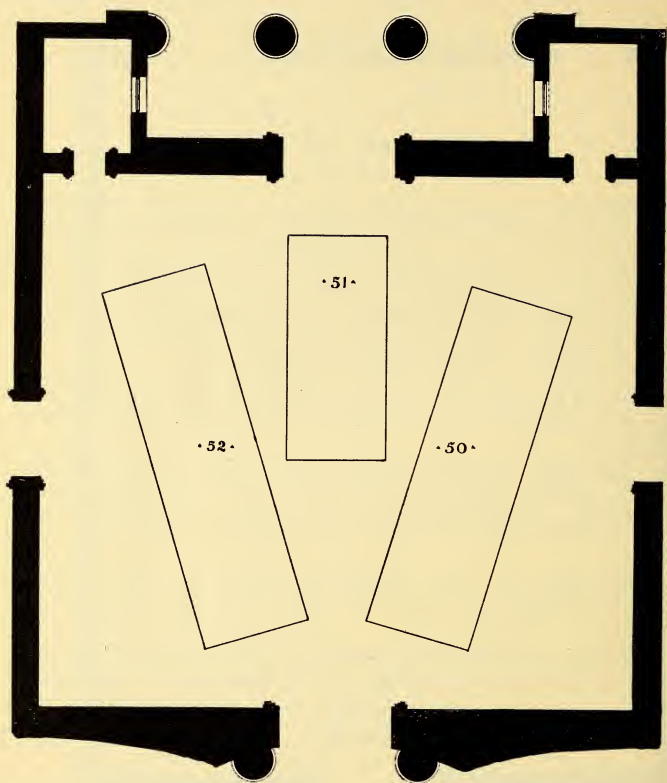
No. 46.—Original passenger car, England, 1831; sent with the "Samson" to Nova Scotia, the year named, and probably the oldest coach in its original form in existence.

No. 47.—Full size working reproduction of the "Buffalo," America, 1844; the first locomotive in the world with 8 wheels coupled.

No. 48.—Full size working reproduction of the "Mount Clare," America, 1844; first locomotive built by the Baltimore & Ohio Railroad at its own shops, and the heaviest locomotive of its time.

No. 49.—Full size working reproduction of the "Camel," America, 1848; the first of the heavy freight locomotives in America.

Upon the Walls, large wash-drawings, showing the development of the locomotive of the world. Also, series of bromides of railroad scenes in remote countries. Also, series illustrating the development of railroad appliances.



PLAN OF HALL 45.



HALL 45.

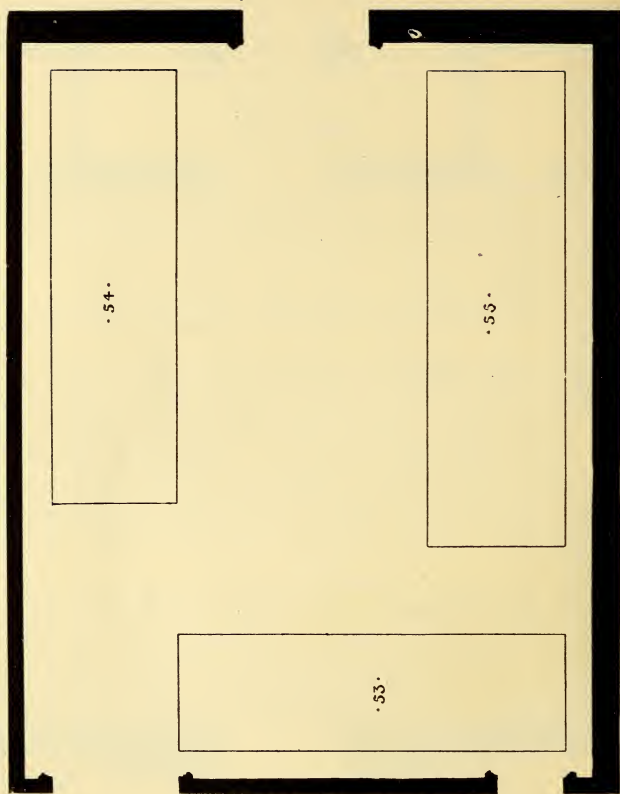
No. 50.—Original locomotive "Dragon," America, 1848; the first with rocking grate, and the oldest Baldwin engine now existing.

No. 51.—Original locomotive "Pioneer," America, 1848; the first in Chicago.

No. 52.—Original locomotive "Mason," America, 1860; one of the earliest of the distinctive American model passenger engines.

Upon the Walls, the Westinghouse series of large original drawings, showing the evolution and development of the railway brake of the world. Another series illustrate the railroad occupation of the United States by decades. Another series show the development of the Pullman sleeping car, and the Wagner sleeping car. Another series of original drawings show the development of the American passenger and freight cars of the Harlan & Hollingsworth Co.

Series of original wash-drawings illustrating the evolution and development of permanent way. Series of drawings and photographs showing exterior and interior views of the royal trains of the world. Series showing development of motive power on the Illinois Central Railroad from 1832 to 1893. Series indicating the development of locomotives and cars on the New York Elevated Lines.



PLAN OF HALLS 43 AND 44.



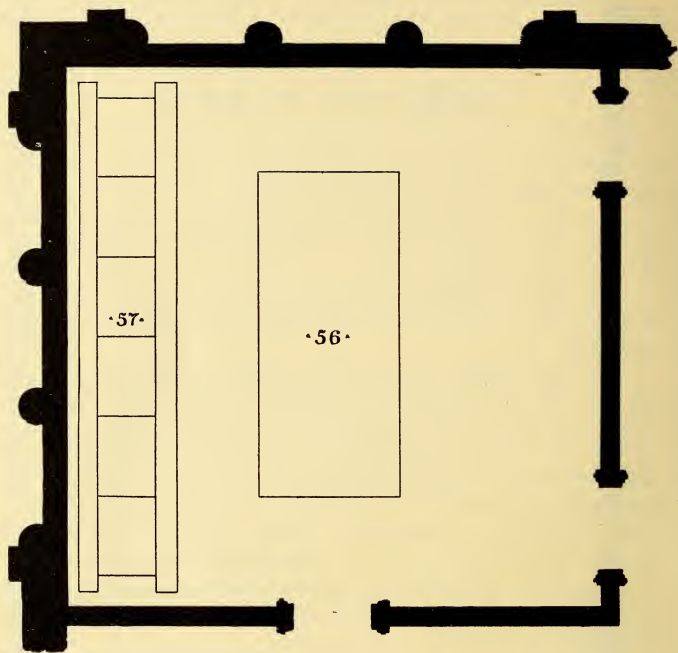
DOUBLE HALL 43 AND 44.

No. 53.—Original 10-wheel "Camel" locomotive, America, 1852; the first of this type of heavy engines.

No. 54.—Original locomotive "Perkins," America, 1862; the first of the special type for climbing the heavy grade of the Allegheny Mountains.

No. 55.—Original locomotive No. "600," America, 1876; the first passenger mogul. This engine was in the Centennial, at Philadelphia.

On the Walls, series of large original wash drawings, showing the modern compound locomotives of the world. Series of original drawings and lithographs of historical engines, cars, and appliances. Series illustrating development of the leading foreign manufactures of locomotives, cars, and appliances. Series of direct tracings, fourteen in number, from the original drawings of George Stevenson's locomotives. Series furnished by the German government, indicating the development of German motive power and equipment. The "West" series complete, consisting of fourteen plates, showing, in detail, the evolution and development of the English locomotive.



PLAN OF HALL 42.



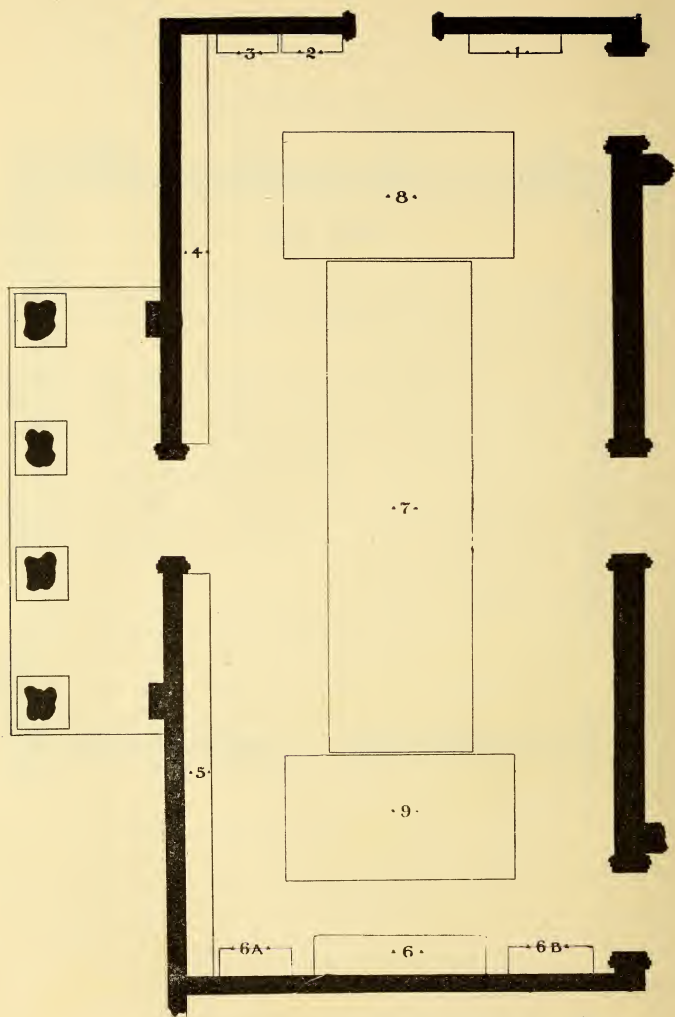
HALL 42.

No. 56.—Original locomotive "Peppersauce," America, 1864; the first mountain-climbing locomotive in the world, standing on a section of the original track.

No. 57.—The original first iron railroad bridge ever erected on the American continent, it being substituted in 1839 for the wooden trestle-work on a crossing near Laurel, on the Baltimore & Ohio line between Baltimore and Washington.

On stands platforms, etc., etc., four original models of early railroad bridges, by Benjamin H. Latrobe. First "Chilled" Steel Locomotive Tires in the World. Collection of original rails and chairs, covering nearly a century of time. Examples of modern appliances, permanent way.

On the Walls. Series of photographs from the Russian government of scenes on the Trans-Caucasian Railway. Series of photographs from the Austrian government, showing the motive power and equipment on Austrian railways. Series of photographs from the Japanese government, showing railway scenes in Japan. Series of original detail drawings of English and French locomotives. Series of special photographic views on German government railways.



PLAN OF HALL 41.



HALL 41.

Cases 1, 2, and 3.—Containing samples of material tested by department of chemical and physical tests of the Pennsylvania Railroad Company.

Case 4.—Relics of early railroad days—lanterns, headlights, pieces of track, etc., etc.

Case 5.—Models showing early train signal and early block signals, together with rails, section of track system, switches, and frogs.

No. 6.—The original Saxby and Farmer interlocking switch. This is the earliest successful switch ever used in America.

Stand 6A.—Relics of early rail joints, car springs, etc., etc.

Stand 6B.—Relics of early track appliances, etc., etc.

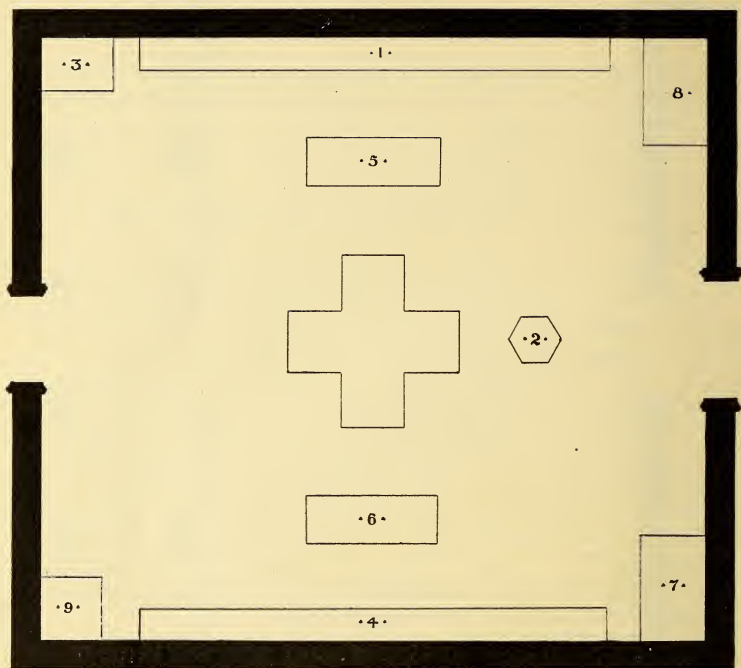
No. 7.—Original Camden & Amboy car, 1836, standing on the original block stone and the original rail of that period.

No. 8.—An original section of early wooden stringer and strap-rail construction, together with one of the original driving wheels of the "John Bull" locomotive, 1831, and wooden switch lever, with signal and cross, 1835; also a pair of cast iron wheels on axle, passenger equipment, 1846, and specimens of early railroad track.

No. 9A.—Section of original "T"-rail track, laid on original stone block and ties, Old Portage Railway.

Nos. 9B and 9C.—Two pair Camden & Amboy wooden passenger car wheels, 1848.

No. 9D.—Freight car wheel, with split-hub keyed to the axle. On the east side of the car are old rails, etc. On the west side are models of early railroad appliances.



PLAN OF HALL 57.



HALL 57.

Case 1, North Wall.—Models of the original "John Bull" and train, 1831. Model of the locomotive "John Stevens," 1825. Model of the locomotive "George Washington," the first locomotive to climb a heavy grade, built by Wm. Norris & Co., 1838. Model of the locomotive "Herald," the first on the Baltimore & Susquehanna Railroad, 1831. Model of the locomotive "Lancaster" and train, built by Baldwin, 1834. Model of passenger car "Victory," 1834. Model of ambulance car used during the war, 1862. Models of baggage and passenger cars Camden & Amboy Railroad, 1850. Model of car on Portage Railroad, 1835. Model of old car used between Rahway and Newark, 1833. Model of passenger car on Portage Railroad, 1834. Series of models showing the sectional canal boats transported on railroad trucks, 1839-1850. Model of machinery of Plane No. 7, Old Portage Railroad, 1835. Model of "Conestoga" wagon. Model of old stage coach, 1825.

No. 9.—Model of monument erected at Bordentown to commemorate first movement of steam in New Jersey.

On the East Wall.—Two panels representing four centuries of progress in transportation.

Case 3.—Model of standard safety underground tunnel for passengers.

Case 4, South Wall.—Early publications and documents. Models of cars on J., M. & I. Road. Models showing modern freight cars for coal. Model of Madison Plane and rack-rail locomotive used on it, 1850. Models showing modern rail, steam lighters, methods of unloading iron ore from vessels to rail, etc., etc. Statistical model showing the Pennsylvania Railway system. Original of largest check ever drawn in an American railroad transaction.

On the North wall, models of seals of corporations, and chart of organization and badges of employes of the Pennsylvania Railroad Company.

In the Center of the Room.—Large model showing the rail crossings of the Alleghenies in the territory on which was located the Old Portage Road of 1832-1852, the New Portage Road of 1853, and the modern system of 1892.

Case 5.—Model showing the transfer of entire freight trains New York harbor.

Case 6.—Large model of the ferry-boat "Washington," running between Jersey City and New York.

Case 7.—Relief map of Philadelphia terminals.

Case 8.—Relief map of Jersey City terminals.

Case 2.—Large globe model showing traffic of the Pennsylvania Railroad system.

About the room are six standards, holding a large number of framed relics, old posters, time-tables, notices, tickets, and receipts for fare, old reports, specifications, and advertisements. The entire aggregate of this series representing nearly 1,000 examples. Also, series of photographs of modern locomotives and views, and statue of Edgar Thompson.

WEST DOME.

Group of statuary typical of the railroad in the center; statues of Commodore Vanderbilt, Thomas Scott, John W. Garrett, and of a brakeman, in the niches. Collection of original early railway curios; also collection of modern railway appliances.

LIBRARY DEPARTMENT.

HALLS 28, 29 AND 34.

The Library Department comprises the Library (Hall 28); the Reading Room (Hall 34), and the Lecture Hall (Hall 29); and is in charge of the Recorder and Librarian, who also records all specimens entering or leaving the Museum. The Library is designed for reference purposes only, and contains many valuable scientific and technical works. These may be consulted by the general public, and will be a great aid to those desiring to pursue special study or investigation on subjects treated in the Museum. A prominent feature of this Department will be the lectures upon various scientific topics of interest and importance, which it will arrange to have given from time to time by specialists acquainted with the results of the latest research.

HALL 28.

THE LIBRARY.

The collection of books and pamphlets on the shelves already numbers nearly 8,000, and is being increased rapidly. It includes:

The Kunz Collection of works on Minerals, Gems, and Semi-Precious Stones, and containing many rare tomes on these subjects in Latin, dating back to the XVth and XVIth Centuries.

The Baltimore and Ohio Collection, collected and loaned by Mr. J. G. Pangborn. This series comprehends nearly every book treating of the origin and early development of Railways and their equipment.

The Special Library of the Department of Ethnology, obtained for the Exposition at the request of the Chief of that Department by contributions from the authors in every land. A wide range of subjects is covered, and the Library is probably one of the best of its kind in this comparatively new science.

The Skiff Collection of works, particularly on Minerals, Mining, and Metallurgy, containing many valuable books of ref-

erence. (This collection has been placed in the Departmental Library of the Mining and Metallurgical Department, West Annex.)

The Special Library of the Department of Mines, Mining and Metallurgy of the World's Columbian Exposition, gathered for exhibition in the Mining Building by the Chief of that Department. Among others includes sets of periodicals bearing on these subjects, and complete sets of geological publications issued by the Government.

The Collection of Russian Works on Forestry, presented by the Imperial Russian Commission to the World's Columbian Exposition.

Valuable accessions to the Library have been furnished by the following: J. E. Watkins, F. C. Baker, H. K. Coale, British Commission, Board of Lady Managers, Board of Education of the Presbyterian Church, W. B. Conkey & Co., Ceylon Commission, A. F. Dewey, Geo. R. Davis, T. W. Egleston, French Commission, German Commission, W. Guerback, J. F. Halloran, Illinois Commission, Kansas Commission, Missouri Commission, Norwegian Commission, New South Wales Commission, Pennsylvania Railroad Company, W. G. Sutherland, Spanish Commission, D. F. Schloss, George Souee, Switzerland Commission, Schloss & Cowhan, Jacob Wile.

Upon the cases are the busts of the eminent scientists and naturalists: Geoffry St. Hilaire, Galien, Esculapius, Columbus, Cuvier, Agassiz, Humboldt, Huxley, Buffon, Hippocrates, Darwin and Linneus.

Department Working Libraries will be established in the different departments, under the supervision of the head of the department.

The Rules give information as to the privileges of the Library:

GENERAL RULES.

1. The Library will be open every day from 9 A. M. until 4 P. M.
2. The library is entirely a library of reference. The books are to be used in the room set apart for that purpose, and not taken from it under any circumstances, excepting by Directors or Curators for use in Working Libraries.
3. Books may be obtained by filling out the Application Slip

and presenting it at the desk. Before leaving the room the borrower shall return the book or periodical to the desk.

4. Current periodicals shall be consulted only in the Reading Room, and will not be permitted to leave the Library, excepting at the instance of Directors or Curators for use in Working Libraries.

5. Any book or periodical drawn from the General Library for Working Libraries, as provided under the Special Rules, will, upon application to the Librarian, be sent for and returned to the General Library for immediate reference purposes.

6. A set of encyclopedias, dictionaries and other general works of reference will be permanently retained in the General Library.

7. Any defacement of books is prohibited, and all losses or injuries shall be promptly adjusted to the satisfaction of the Librarian.

8. These rules shall be posted in the Library, and shall be subject to change from time to time by the Library Committee

HALL 34.

THE READING ROOM.

Here will be found the reading tables, which will be supplied with magazines and periodicals pertaining more particularly to scientific, technical and kindred subjects.

In this room are held meetings of the Council, consisting of the Director-in-Chief, and all of the Directors and Curators, who assemble regularly to discuss the affairs of internal administration of the Museum.

HALL 29.

THE LECTURE HALL.

This is reserved for all public meetings, lectures, etc., held in the Museum. It is the intention to establish, as soon as circumstances warrant, courses of lectures on scientific and technical topics.

Upon the wall of this room is an equestrian picture of Gen. John A. Logan, donated by the Veteran Club of Chicago.

THE OFFICES OF THE MUSEUM.

THE EXECUTIVE COMMITTEE—Southwest Corner of South Court.

THE DIRECTOR-IN-CHIEF—Southeast Corner of South Court.

THE DEPARTMENT DIRECTORS—Northeast Corner of North Court.

THE CURATORS will be found in their respective divisions.

THE RECORDER AND LIBRARIAN—Northwest Corner of North Court.

THE SUPERINTENDENT OF THE BUILDING—Southwest Corner of South Court.

THE ACCOUNTANT—Southeast Corner of South Court.

APPENDIX.

EXPLANATION:—**D.** REPRESENTS DONORS. **L.** LOAN CONTRIBUTORS. **C.** COLLECTORS.

A

Acme Cement Plaster Co. (D).
 Adams, C. F. (C).
 Admissions Department, W. C. E. (D).
 Agricultural Department, W. C. E. (C).
 Aitchison Metal Co., Robt. (D).
 Alan Wood Co. (D).
 Albion Clay Co. (D).
 Alchevskaia, Mr. (D).
 American Book Co. (D).
 American Bronze Co. (D).
 American Cement Co. (D).
 American Manufacturer & Iron World. (D).
 American Tripoli Co. (D).
 Ams, Max. (D).
 Anderson, David. (D).
 Anker, Chr. (D).
 Ardeshir & Byramji. (D).
 Arizona Commission, W. C. E. (D).
 Argentine Commission, W. C. E. (D).
 Arkansas Commission, W. C. E. (D).
 Armstrong Bros. & Co. (D).
 Armstrong, Theo. (D).
 Arctic Whaling Exhibit Co. (D & C).
 Associated Irish Railways. (D).
 Austrian Commission, W. C. E. (D).
 Ayer, Edward E. (D).

B

Bacon, G. W. Co. (D).
 Baker Car Heater Co. (D).
 Baker, Frank. (D).
 Baldwin Locomotive Works. (D).
 Ballin, Mëyer. (D).
 Baltimore Journal of Commerce. (D).

- Baltimore & Ohio R. R. Co. (D).
 Barnhart Bros. & Spindler. (D).
 Barton, S. W. (C).
 Bartlett, A. C. (D).
 Bartlett, Wm.. Sons. (D).
 Barattoni, C. A. (D).
 Bassels, Vincente, (D).
 Baur, Dr. George. (L).
 Belfast & Northern Counties Railways. (D).
 Bell, Catlett & Miller Co. (D).
 Bell, Robert. (C).
 Bent, E. J. (D).
 Bergen Port Sulphur Works. (D).
 Bertollette, D. N. (C).
 Best Bros. & Co. (D).
 Bhumgara Co. (D).
 Black Rock Mining Co. (D).
 Blake, W. P. (D).
 Blackie & Son, Limited. (D).
 Board of Education of the Presbyterian Church. (D).
 Board of Lady Managers, W. C. E. (D).
 Boas, Franz. (D & C).
 Bolton, T. L. (C).
 Booth, Vernon. (D).
 Borgner, Cyrus. (D).
 Boyden, Obadiah S. (D).
 Bowers, F. G. (D).
 Bowers, Stephen. (C).
 Bradley, Milton & Co. (D).
 Brazil Commission, W. C. E. (D).
 British Colombia Commission, W. C. E. (D).
 British Commission, W. C. E. (D).
 British Guiana Commission, W. C. E. (D).
 British India Commission, W. C. E. (D).
 Brough, Bennet H. (C).
 Brown & Co., John. (D).
 Brown, James. (D).
 Bruce, Minor W. (C).
 Buckeye Portland Cement Co. (D).
 Buchanan, James. (D).

Buell, F. T. (D).
 Bulgarian Commission. (D).
 Bunzlauer, Glasfabrik Carlswerk. (D).
 Bunzo, Fujita. (D).
 Burchard, Horatio C. (D).
 Burdette-Coutts, Baroness. (D).
 Burgland & Shead. (D).
 Bureau of American Republics. (D).
 Burrows, Daniel W. (D).
 Bush, L. L. (C).

C

Callaghan & Co. (D).
 California Commission, W. C. E. (D).
 Calverts. F. C. (D).
 Campagnie, Francaise des Mines de Laurium France. (D)
 Canada Iron Furnace Co., Limited. (D).
 Cape Colony Commission, W. C. E. (D).
 Ceylon Commission, W. C. E. (D).
 Chadwick, John W. (D).
 Chandler, Frank R. (D).
 Chapman & Hall, Limited. (D).
 Charnay, Desiré. (C).
 Cheesewright, F. H. (D).
 Cherrie, C. (C).
 Chicago Copper Refining Co. (D).
 Chicago & North-Western R. R. Co. (D).
 Chicago Veteran Club. (D).
 Childs, J. S. (D).
 Chinese Commission, W. C. E. (D).
 Chili Commission, W. C. E. (D).
 Chisholm, Boyd & White. (D).
 Coale, Henry K. (L).
 Colombia Commission, W. C. E. (D).
 Colorado Commission, W. C. E. (D).
 Colorado Fuel & Iron Co. (D).
 Columbian Ceramic Society. (D).
 Combe, Barbour & Combe. (D).
 Connecticut Commission, W C E. (D).
 Conkey Co., W. B. (D).
 Cooke. (C).

Copper Queen Consolidated Mining Co. (D).
 Coplay Cement Co. (D).
 Corea Commission, W. C. E. (D).
 Cory Bros., Ltd. (D).
 Cowie, Isaac. (C).
 Corydon Stone Co. (D).
 Cowham, Jos. H. (D).
 Crown Preserved Coal Co. (D).
 Curacao Commission, W. C. E. (D).
 Curtis & Harvey. (D).
 Curtis, William E. (L. & C).

D

Danish Commission W. C. E. (D).
 Davenport, C. L. (C).
 Davis, Chas. T., Pub. Co. (D).
 Davis, George R. (D).
 Davis, Dr. M. L. (D).
 Deans, James. (C).
 Del Nero, Angelo. (L).
 Department of Admissions, W. C. E. (D).
 Dewey, A. F. (D).
 Doble Co., Abner. (D).
 Dorsey, G. A. (C).
 Drake Co., The. (D).
 Dunham, G. D. (D).
 Dysart, Samuel. (D).

E

East Anglian Cement Co. (D).
 East Tennessee Land Co. (D).
 Ecuadorian Commission, W. C. E. (D).
 Eells, Myron. (C).
 Eggleston, Prof. T. W. (D).
 Elbers, A. D. (D).
 Electro-Automatic Appliance Co. (D).
 Emmens Metal Co. (D).
 Empire Portland Cement Co. (D).
 Ethnology Department, W. C. E. (C).
 Ethnographic Museum, Liepzig, Vienna, Berlin. (D).

F

- Fairbanks, A. W. (C).
 Fandon, Manuel. (D).
 Fearn, Richard Lee. (D).
 Fernandez, Pedro. (D).
 Fernow, Prof. B. E. (L).
 Finsch, Otto. (C).
 Finance Committee, W. C. E. (D).
 Financial Despatch and Commercial Pub. Co. (D).
 Fisher, Adolfo. (D).
 Florida Commission, W. C. E. (D).
 Folonov, M., Governor of Viatka. (D).
 Foster & Son. (D).
 Fort Madison & Appanoose Stone Co. (D).
 Fowler, Enos. (L).
 Francis & Co., Limited. (D).
 French Commission, W. C. E. (D).
 French General Asphalt Co. (D).
 Frisch, Albert. (D).
 Fritsche Bros. (D).
 Fuller, F. W. (D).
 Fullers Earth Mining Co. (D).
 Funk & Co. (D).

G

- Gage, Lyman J. (D).
 Galitzki, L. (D).
 Georgia Bauxite & Mining Co. (D).
 General Electric Co. (D).
 Geological Survey of Sweden. (D).
 German Commission, W. C. E. (D).
 Giesler, R. G. (D).
 Gould Coupler Co. (D).
 Goldsmith, J. S. (C).
 Government Board of Management for the W. C. E. (D).
 Government Printing Office, Berlin. (C).
 Goyard, M. (D).
 Gramm, Carl Theodor. (D).
 Greek Commission, W. C. E. (D).
 Gree, C. H. (C).

Great Northern Railways of Ireland. (D).
 Gibbs Co., Limited. (D).
 Guatemala Commission, W. C. E. (D).
 Guerback, W. (D).
 Gunning, W. J. (L).
 Gutieviez, Antonio. (D).

H

Hagenbeck, Carl. (C).
 Hales, Harry. (C).
 Hall, T. P. (C).
 Hallidie, A. S. (D).
 Hamilton, W. A. (C).
 Hamilton, David G. (D).
 Hansen, Rasmus. (D).
 Hardin, Edward B. (D).
 Hardtmuth, L. & C. (D).
 Harper Bros. (D).
 Hart, Miss Lydia M. (D).
 Hassler, Dr. Emil. (C).
 Haupt, H., Jr. (D).
 Hayssen, H. H. (L).
 Hayward, Lucy L. (D).
 Heber, A. H. (D).
 Hess, Geo. H. & Co. (D).
 Heap Manufacturing Co. (D).
 Healey, Misses. (D).
 Heinze, Adolph. (D).
 Hibbard, Wm. G. (D).
 Hibner, R. (D).
 Houston, Sam H. (D).
 Horstman, Richard. (D).
 Hoerder Bergwerks & Hütten Verein. (D).
 Hoshida, M. (D).
 Hostetter, A. B. (D).
 Howell, Edwin S. (D).
 Hoppin, Capt. C. B. (D).
 Houghton, Mifflin & Co. (D).
 Hunt, Geo. (C).

I

- Illinois Brick & Tile Association. (D).
 Illinois Railway Co. (D).
 Illinois Central R. R. Co. (D).
 Illinois Commission, W. C. E. (D).
 Illinois Fluor-Spar & Lead Co. (D).
 Imperial Russian Society for Encouragement of Sea
 Trading Navigation. (D).
 Imura, H. (D).
 Indiana Commission, W. C. E. (D).
 Indiana Stone Co. (D).
 Indurated Fibre Ware Co. (D).
 Institution of Empress Mary, Russia. (D).
 International Water & Sewerage Purification Co. (D).
 Iowa Commission, W. C. E. (D).
 Iron Trade Review Co. (D).
 Irish Village (Midway). (D).
 Italian Commission, W. C. E. (D).

J

- Jackson, Adrian. (C).
 Jacobssen, Phillip. (C).
 Jacovkin, I. I. (D).
 Jackson, Sheldon. (C).
 Jamaica Commission, W. C. E. (D).
 Japanese Commission, W. C. E. (D).
 Japanese Tea Association. (D).
 Japanese Central Association. (D).
 Japanese Tea House. (D).
 Javanese Commission, W. C. E. (C).
 Jastrow, Prof. J. (C).
 Jessup, W. & Son. (D).
 Johns, H. W., Mfg. Co. (D).
 Johnson, Edmond. (D).
 Johnson, W. & A. K. (D).
 Johore Commission, W. C. E. (D).

K

- Kaldenberg, F. W. (D).
 Kansas Commission, W. C. E. (D).

Kaven. (C).
 Kelly & Co., Limited. (D).
 Kemper, E. G. (D).
 Kentucky Commission, W. C. E. (D).
 Khakhlow, A. (D).
 Kirk, W. F. (D).
 Kirk & Son, Arthur. (D).
 Klementiev, N. (D).
 Knowlton, James. (C).
 Komada, H. (D),
 Krestovnikoff Bros. (D).
 Kuhe, R. (D).
 Kunz, George F. (D & C).
 Kyoto Tea Association. (D).

L

Landsberg, Max. (D).
 Latin-American Bureau, W. C. E. (D).
 Lattin, F. H. & Co. (D).
 Lathrobe Steel Co. (D).
 Lavrentiev, J. (D).
 Leather and Shoe Trades Association. (C).
 Leffel, James & Co. (D).
 Lemley, Lieut. H. R. (C).
 Levy, Robert, Co. (D).
 Lipe, Chas. E. (D).
 Lipperheide, Franz. (D).
 Lindblom & Co., Robert. (D).
 London & North-Western R. R. Co. (D).
 Lord, W. B. (D).
 Louisiana Commission, W. C. E. (D).
 Lowney, Walter M. (D).
 Lumholtz, Carl. (C).
 Lyon & Healy. (D).

M

Mac Kay, Henry S. (D).
 Mamlock, H. (D).
 Mann Bros. (D).
 March Co., The John. (D).

Maudslay, Alfred P. (C).
 Masten & Co., J. W. (D).
 Matsura, Kanzo. (D).
 Maw & Co., Limited. (D).
 McCune, W. A. & Co. (D).
 McDonald, A. (D).
 McFarlane Bros. (D).
 McFaul, Thomas. (D).
 McLean, John. (C).
 McLain, A. J. (D).
 McMurdy, Robt. (D).
 Meyer & Son. (D).
 Mexican Commission, W. C. E. (D).
 Michigan Commission, W. C. E. (D).
 Midland Railway of England. (D).
 Mines & Mining Department, W. C. E. (C).
 Mining and Scientific Press Pub. Co. (D).
 Minnesota Commission, W. C. E. (D).
 Mississippi River Logging Co. (D).
 Monson, George S. (D).
 Moorehead, Warren K. (C).
 Moulton, Francis D., & Co. (D).
 Mount Airy Granite Co. (D).
 Mount Washington R. R. Co. (D).
 Montes, Emilo. (C).
 Monpede, A. T. (L).
 Morales, Thedora. (D).
 Morrison, Mrs. O. (C).
 Morning Star Mining Co. (D).
 Mussleburg Wire Co. (D).
 Mudd, S. W. (D).

N

Narragansett Machine Co. (D).
 Naturhistorisches Museum, K. K. (D).
 Nebraska Commission, W. C. E. (D).
 New Hampshire Commission, W. C. E. (D).
 New Mexico Commission, W. C. E. (D).
 New South Wales Commission, W. C. E. (D).
 New York Commission, W. C. E. (D).

Niwa, Keisuke. (C).
 North Western Terra Cotta Co. (D).
 Norwegian Commission, W. C. E. (D).
 Nye, W. F. (D).

O

Ober, F. A. (L. & C).
 Oceanic Trading Co. (C).
 O'Connor, M. J. (D).
 Oeffelein & Co. (D).
 O'Fallon, Miss E. (L).
 Ohio Commission, W. C. E. (D).
 Ontario Commission, W. C. E. (D).
 Orange Free State Commission, W. C. E. (D).
 Oregon Commission, W. C. E. (D).

P

Pacific Flushing Tank Co. (D).
 Paine, John K. (D).
 Parrot Silver & Copper Co. (D).
 Peace, J. G. (C).
 Pearce, J. A. (C).
 Pelaez, Pedro. (D).
 Peary, R. (C).
 Pennsylvania Commission, W. C. E. (D).
 Pennsylvania R. R. Co. (L).
 Pennsylvania Salt Manufacturing Co. (D).
 Persian Commission, W. C. E. (D).
 Peruvian Commission, W. C. E. (C).
 Philadelphia & Reading R. R. Co. (D).
 Philadelphia Engineering Works. (D).
 Pittsburgh Coal Exchange (D).
 Pittsburgh Crushed Steel Co. (D).
 Pogosky, Mrs. A. (C).
 Pope, J., & Son (D).
 Prince, George. (D).
 Prolevaya, Mrs. (D).
 Prozorof & Sons. (D).
 Pullman Palace Car Co. (D).
 Putnam, Prof. F. W. (D & C).

Q

- Quebec Commission, W. C. E. (D).
 Quelch, J. J. (C and D).

R

- Rafford, J. W. (D).
 Randall F. A., & Co. (D).
 Ramon de la Vega. (D).
 Ranck, The D. H., Publishing Co. (D).
 Redlick Manufacturing Co. (D).
 Remenyi, Ed. (C).
 Reeves Pulley Co. (D).
 Riddle, Maxwell (C).
 Risser & Co., A. F. (D).
 Rockhill, Wm. W. (D).
 Rœbling's, John A., Sons Co. (D).
 Rössler & Hasslach Chemical Co. (D).
 Rogers, Brown & Co. (D).
 Rogers Locomotive Works (L).
 Rorstrands, Aktiebolag. (D).
 Royal Persian State Railways (D).
 Ruoff, Henry (C).
 Russian Cement Co. (D).
 Russian Commission, W. C. E. (D).

S

- Safford, Lieutenant (C).
 Sanchez, P. (D).
 Salisbury Mining Co. (D).
 San Juan del Rey Mining Co. (D).
 Sanders, Hubert (D).
 Sandusky Portland Cement Co. (D).
 Sanitary Commission of Chicago. (D).
 Sanitary Garbage Pail Co. (D).
 Seward, Frederick E. (D).
 Schenectady Locomotive Works (D).
 Schloss, D. F. (D).
 Scott, James W. (D).
 Scriven, Geo. F. (C).
 Seidler, H. L. (D).

Seto Porcelain Mfg. Co. (D).
 Shahovsky, Princess Marie (C).
 Shobey, S. (D).
 Shurtleff, Geo. F. (C).
 Sioux Valley Stone Co. (D).
 Siamese Commission, W. C. E. (D).
 Skiff, F. J. V. (D., C. & L).
 Sling Hong. (L).
 Smith, Hugh. (D & C).
 Smith, Norton I. (C).
 Smith, C., & Sons. (D).
 Smith, Williard A. (C & D).
 Smythe, A. H. (D).
 Smyrnoff, N. M. (D).
 Snell, Merwin M. (L).
 Society of Encouragement of Travel, Prague. (D).
 Society of German Women. (D).
 Solovien, M. (D).
 Sorip, M. (C).
 Soule, George. (D).
 South Dakota Commission, W. C. E. (D).
 South Park Commissioners. (D).
 Spanish Commission, W. C. E. (D).
 Stafford, O. C. (C).
 Starr, Frederick (C).
 Standard Oil Co. (L).
 Standard Asphalt Co. (D).
 Stanley Mining Co. (D).
 Stephenson, John. (D).
 Steere, Prof. J. B. (D).
 Stumm Brothers. (D).
 Susse Freres. (D).
 Suydam, John. (D).
 Swan, Jas. G. (C).
 Swartz Iron & Metal Co. (D).
 Swedish Commission, W. C. E. (D).
 Sweet & Maxwell, Limited. (D).
 Swineford, Governor. (C).
 St. Mary's Porcelain China Works. (D).

T

- Theodorovich, Mr. (D).
 Thomas, F. H., Law Book Co. (D).
 Thompson, F. H. (C).
 Tichomirov, M. (D).
 Tiffany & Co. (D).
 Tiffany Pressed Brick Co. (D).
 Tisdale, A. R. (C).
 Transportation Exhibits Department, W. C. E. (D).
 Trenton Iron Co. (D).
 Trinidad Commission, W. C. E. (D).
 Truax Manufacturing Co., The. (D).
 Turkish Commission, W. C. E. (D).
 Turner, W. G. (L).
 Typen, Vauder. (D).

U

- United Alkali Co., Ltd. (D).
 United Coal Co. (D).
 U. S. Department of Agriculture. (D).
 U. S. Colombia Commission, W. C. E. (C).
 U. S. Department of State. (L).
 U. S. Encaustic Tile Works. (D).
 Uribe, Abel. (D).
 Utah Commission, W. C. E. (D).

V

- Vatican, The. (D).
 Venezuela Commission, W. C. E. (D).
 Venice & Murano Exhibiting Co. (D).
 Virchow, Prof. Hans. (D).
 Virginia Commission, W. C. E. (D).
 Volk, Ernst. (D).

W

- Ward Natural Science Establishment. (C).
 Wagner Palace Car Co. (D).
 Walker, Mrs. S. B. (D).
 Waldhof Sulphite Co. (D).
 Wallerson Rod and Reed Co. (D).
 Warren Chemical Works (D).
 Warren-Scharf Asphalt Paving Co. (D).

Washington Commission, W. C. E. (D).
 Washington Memorial Arch, Committee on The. (D).
 Watano, Kichiji. (D).
 Weimer Machine Works. (D).
 Weaver, Henry E. (C & D).
 Wells, John. (D).
 Wendt, Arthur F. (D).
 Wessel, Nickel & Gross. (D).
 Westinghouse Co., The. (D).
 West, G. M. (C).
 Weston, Eugene. (D).
 Western Mineral Wool Co. (D).
 Wheeler, C. C. (D).
 White, T. & S. C. (D).
 White Cap Mining Co. (D).
 Wharton, Joseph. (D).
 Wile, J. (D).
 Wilson, E. F. (C).
 Wilson, L. H. (D).
 Wilson, S. L. (D).
 Wilzinski, L. (D).
 Winston, Fred. N. (D).
 Wisconsin Lead & Zinc Co. (D).
 Women of Cuming County, Neb. (D).
 Worcester Royal Porcelain Works. (D).
 Woodruff, Frank M. (D).
 Woodside, John W. (D).
 World's Fair Venetian Gondola Co. (D).
 Wyman Bros. (D).
 Wyoming Commission, W. C. E. (D).

Y

Yambe, Y. (D).
 Yassuminsky, V. E. & A. (D).

Z

Zimmerman, John (D).

Total Donors.....	416
Total Loan Contributors.....	18
Total Collectors.....	83

(Corrections are requested).



